Psychological capital: a person-centered approach

by

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Abstract

Psychological capital is an individual's positive psychological state of development consisting of hope, self-efficacy, optimism, and resilience. Previous research has focused on variable-centered approaches to studying PsyCap, where individual variation amongst the dimensions is aggregated, and differences between people are not given much attention. This study sought to fill that gap by utilizing Latent Profile Analysis, a person-centered approach. This seeks to find response patterns in the data, and then groups individuals who responded similarly throughout the measure into the same profile. The results of the study revealed four profiles with quantitative differences. No varying levels of these dimensions were present, the profiles all had roughly the same dimensional scores, varying from medium to high levels of PsyCap. Job demands and resources, as well as employee age, provided a means to predict which employees would be in each profile. This knowledge is a strong first step in understanding what profiles might be emerging in organizations, and why.

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Chapter 1 - Introduction

Psychological capital (PsyCap) has become increasingly popular with researchers and practitioners alike given its strong link with performance and the ease with which it can be developed in employees. In the years since its introduction in 2004, research on this evidence-based positive construct has made much progress in a variety of areas, greatly increasing our breadth of knowledge on the topic. Yet, no approach has examined PsyCap from a person-centered perspective, compared to traditional variable-centered methods. The person-centered style of analysis focuses on the individual dimensions of the higher order construct to describe differences across individuals and provides great insight to complement traditional approaches. By examining each level of the dimensions of a construct, valuable details can be utilized, rather than lost when averaging or summing responses into composite scores. As PsyCap development is gaining more prominence, immense value and precision could be added by knowing the level of each separate component of the construct, and perhaps even if the employee fits a certain profile. In response to a recent call for research, (Luthans & Youssef-Morgan, 2017), this study sought to answer the question of whether distinct profiles of varying levels of hope, self-efficacy, resilience, and optimism exist in the positive core construct of Psychological Capital. This paper first provides an introduction to PsyCap, followed by an in-depth look at each of the constituent constructs. Next, the state-like nature of PsyCap is discussed, and a summary of methods to develop it is presented. Then the competitive advantage that PsyCap provides is highlighted, and the study is outlined. Finally, the findings and implications of the study are discussed.

Psychological Capital

The positive psychology movement, spurred by Seligman and Csikszentmihalyi (2000), readjusted the mental illness-focused effort of psychological research to a deeper examination of

human strengths, happiness, and productivity, which in some ways had already been a focus, especially in IO psychology, through research on KSAOs, job satisfaction, job performance, and organizational citizenship behaviors. Although organizational behavior did have a much more positive approach than clinical psychology, room for improvement still existed. From an industrial-organizational psychology perspective, it became a priority to identify psychological capacities that fit Positive Organizational Behavior's (POB) focus on 'studying and applying positively oriented human resource strengths and psychological capacities that can be measured, developed, and effectively managed for the performance improvement in today's workplace' (Luthans, 2002). Past research found support for four such constructs, which have recently been combined to develop a higher order core construct known as Psychological Capital (PsyCap). This construct is comprised of four psychological resources: hope, self-efficacy, resiliency, and optimism, and is described as an 'individual's positive psychological state of development' (Luthans, Youssef, & Avolio, 2007). PsyCap is a higher order construct that focuses on who you are and who you are becoming, rather than what you know (human capital) or who you know (social capital). Luthans, Youssef, and Avolio describe PsyCap as follows:

> PsyCap is an individual's positive psychological state of development and is characterized by: (1) having confidence (self-efficacy) to take on and put in the necessary effort to succeed at challenging tasks; (2) making a positive attribution (optimism) about succeeding now and in the future; (3) persevering toward goals and, when necessary, redirecting paths to goals (hope) in order to succeed; and (4) when beset by problems and adversity, sustaining and bouncing back and even beyond (resiliency) to attain success. (p. 3).

The components of PsyCap provide employees with a pool of personal resources that can be used to most effectively strive towards goals. Each construct's contribution is described in detail in the following sections.

Self-Efficacy

PsyCap self-efficacy is rooted in Bandura's social cognitive theory (Bandura, 1997) and refers to an individual's belief in their capability to perform a given task well by activating their 'motivation, cognitive resources, and courses of action' (Stajkovic & Luthans, 1998). It is also interchangeably referred to as a person's confidence (Luthans, Youssef, & Avolio, 2007). When faced with difficult challenges, those high in self-efficacy typically believe that they are in control of the outcome of the task and can achieve success. They are highly self-motivated and voluntarily set and strive towards more difficult goals than those low in self-efficacy; they thrive on the challenge and tenaciously work through obstacles. Even failures, criticism, skepticism, setbacks, and self-doubt have little effect on those with high-self-efficacy (Bandura & Locke, 2003). In contrast, individuals low in self-efficacy feel uncertain about the outcome and their chance of success (Bandura, 1997), and can easily be derailed by those same negative events.

An individual's self-efficacy influences internal perceptions of their probability of achieving a specific goal. This probability can be very high for one task, and very low for another because of the state-like nature and domain specificity of self-efficacy. Generalized self-efficacy has been researched as well, which represent a person's level of self-efficacy overall instead of regarding a specific task. For instance, core self-evaluations evaluate self-efficacy, however, this construct taps into the trait of generalized self-efficacy (Judge & Bono, 2001), rather than state-like self-efficacy that is measured in PsyCap. This domain-specific self-efficacy is strongly influenced by the extent to which you have mastered the particular task you are

working on (Luthans, Youssef, & Avolio, 2007), with feelings of high self-efficacy being much more likely for highly-practiced tasks than for new and unfamiliar tasks. Self-efficacy can also exist at the group level, where it represents the group's collective belief that the capabilities of the group will allow them to succeed at the given task (Bandura, 1997; Riggs & Knight, 1994).

PsyCap efficacy has been shown to have a well-established relationship with work-related performance. Metanalytic findings have indicated there is a strong positive correlation (.38) between the two constructs (Stajkovic & Luthans, 1998); this relationship is stronger than other widely recognized organizational behavior methods typically used by employers (i.e. goal setting, feedback, transformational leadership; Luthans, Youssef, & Avolio, 2007). Self-efficacy has also been shown to be related to work attitudes (Luthans, Zhu, & Avolio, 2006) and effectively working under different stressors (Bandura & Locke, 2003). Collective efficacy has been shown to be related to a group's level of performance (Bandura, 1993), team effectiveness, and motivation (Prussia & Kinicki, 1996). It also was found to be positively related to organizational commitment and job satisfaction, while being negatively related to undesirable work behaviors such as withdrawal (Walumba, Wang, Lawler, & Shi, 2004).

Optimism

PsyCap Optimism refers to an expectation that good events will occur in the future, rather than a pessimistic view of bad events looming ahead. Of great importance is the way in which events are reasoned through. An optimistic explanatory style is a way of thinking in which positive events are accurately attributed to internal personal factors that are permanent and universal causes, and negative events are attributed to external factors that are temporary and specific to a given situation (Seligman, 1998). This essentially uses the well-known self-serving bias of positive events, but this optimism differs from pure self-serving bias, as mentioned later,

through an emphasis on realities and flexibility, where appropriate reasoning is utilized to counter the negative effects of a purely external attribution style following every negative events. On the contrary, those with more negative methods of thinking blame themselves for dreadful things that happen, and attribute successes to chance or luck. In an organization, an optimistic employee is less likely to let negative feedback derail them, as this would be attributed to situational constraints. Recognition for a job well done would be attributed to their work ethic and effort. A pessimistic employee would accredit the negative feedback to faults about themselves as a person, such as a lack of intelligence, which cannot be remedied. Getting placed on a highly sought-after project at work would be credited to things such as 'being in the right place at the right time,' or a lack of interest from highly qualified candidates for the role. The future-oriented aspect of optimism is also important to note; the positive attribution style carries over into how the individual believes upcoming events will turn out. Those low in optimism think that the internal characteristics that caused them to fail will continue producing the same issues in the future. However, those high in optimism are positive and confident about what the future holds.

Many individuals have overlooked optimism as a psychological strength (Luthans Youssef, & Avolio, 2007), calling it unrealistic, shallow, and irrational (Taylor, 1989; Tiger, 1979). Unchecked optimism is seen as a concern due to a possible lower probability of learning from mistakes since negative events are externalized, and a tendency to engage in risky behaviors because of a likelihood of underestimating the threats of the behavior. PsyCap optimism (and Schneider's, 2001, conceptualization) does not support this type of blind, unchecked positivity, but rather, it emphasizes two qualifiers: being realistic and flexible. Flexible optimism essentially means being open to examining situations in terms of both internal

and external explanatory styles for positive and negative aspects of events. For example, just because it is a negative event doesn't mean a person should explain it away as an external reason for the negative outcome. Instead, once information about the situation is known, the appropriate appraisal can be made. Further, it is possible for an individual to be both a 'pessimist' and an 'optimist', depending on the event (Luthans, Youssef, & Avolio, 2007), making it important for an individual to gather all information about a specific situation prior to attributing it to themselves or an external event. Not all situations should be appraised in the manner that characterizes optimism (ex: this problem is not my fault, but due to situational factors). Sometimes, an individual needs to be able to look at a problem and see that it isn't a result of external factors, but rather is an issue that they are a part of that needs their attention to fix because it will be a problem in the future too. Optimism requires a layer of realism, and a diligence to avoid extremism. Not all successes can be claimed as your own; others' contributions should be recognized as well. Not all failures can be externally driven either; mistakes should be learned from. Without realistic views of how much control a person has over a situation, an overly optimistic individual may view the relationship between their effort and future success as too strong, further demonstrating that too much optimism can have negative consequences. Specifically, if this type of individual is faced with long bouts of adversity blocking them from success, despite their efforts, their health can be adversely affected both psychologically and physically as they struggle to continually externalize negative events (Peterson & Chang, 2002). In sum, those with high levels of PsyCap optimism are disciplined in their analysis of the events in their lives. Importantly, their optimistic outlook allows them to take credit for their successes, yet learn from mistakes by analyzing the situation, finding the

facts, accepting what is out of their control rather than dwelling on it, and moving on to more positive experiences that they feel the future holds (Luthans, Youssef, & Avolio, 2007).

Having optimistic employees can be particularly valuable for an organization because it helps employees to take charge and be in control of their future. This positively oriented processing style leads to a potentially beneficial outcome; self-fulfilling prophecies (Peterson & Chang, 2002). However, it should be noted that the same causal pattern is true of employees low in optimism; if they think they cannot meet expectations because of a fundamental problem within themselves, they are unlikely to succeed. Evidence has shown that optimism is positively related to workplace performance (Luthans, Avolio, Avey, & Norman, 2006; Luthans, Avolio, Walumbwa, & Li, 2005), a relationship first documented with Seligman's (1998) study with Met Life job applicants. He found that found new sales representatives with optimistic attribution styles (measured with the Attribution Style Questionnaire (Peterson et al., 1982), an individual difference measure), who had done poorly on an industry test, outsold pessimistic sales representatives over time (21 percent in year one, and 57 percent in year two). This same group of optimistic yet inadequate new hires were also selling about as much as their optimistic and knowledgeable counterparts. The results of this study provided strong evidence that optimism could predict performance just about as well as an industry test. Further, optimism has been shown to be positively related to performance in other contexts such as education, athletics, and politics (Peterson & Barrett, 1987; Peterson & Seligman, 2004; Prola & Stern, 1984; Seligman, 2002). Last, in terms of optimism's impact in a leadership setting, research has shown that positive leaders are more authentic and effective (Avolio & Luthans, 2006; Jensen & Luthans, 2006; Luthans, Norman, & Hughes, 2006).

Hope

Hope is defined as "a positive motivational state that is based on an interactively derived sense of successful (a) agency (goal-oriented energy) and (b) pathways (planning to meet goals)" (Snyder et al., 1991). Agency and pathways give people "the will (agency) and the way (pathways)" to meet their goals in today's workplaces. Specifically, agency provides individuals with the drive to pursue their goals. Being strong willed, determined, and driven are all characteristics of a person high in hope's agency dimension. These individuals typically set their own challenging goals to pursue and enjoy the process. However, if an obstacle blocks them from reaching this goal, the pathways dimension of hope is then utilized by seeking out different paths to success in the face of difficulties (Snyder, 1995, 2000; Snyder, Rand, & Sigmon, 2002). When pathways aren't utilized at all, individuals stop goal pursuit and stay 'stuck' at the obstacle, which could be considered an early phase of learned helplessness (Luthans, Youssef, & Avolio, 2007). Thus, it is apparent that having just one aspect of hope is not enough; someone can have all the will in the world, but if an obstacle blocks the way and they aren't prepared to go around, it can end their goal pursuit.

Pathways (waypower) may be the defining feature of PsyCap hope, but both pathways and agency (willpower) work continually to build upon one another to form an upward spiral of hope. During the initial goal pursuit, the motivation and willpower of agency is used to seek different pathways around an obstacle. As pathway capacities are then used to resourcefully and creatively find alternative ways to succeed, this new opportunity is enough to increase feelings of control and spur the motivation of agency again as the goal is pursued further (Snyder, 2000, 2002). While hope does seem similar to the other PsyCap components, empirical studies have supported the discriminant validity of hope, mainly stemming from the pathway component, as

well as its conceptual independence from the other three constructs (Luthans, Luthans, & Luthans, 2004).

Research on hope has established its relationship with performance in a variety of domains such as achievement in school and sports (Curry, Snyder, Cook, Ruby, & Rehm, 1997), coping skills (Onwuegbuzie & Snyder, 2000), physical and mental health (Kwon, 2000), and other areas of wellbeing (Range & Pentin, 1994; Scioli, et al., 1997; Snyder, 2000). Hope has not yet been extensively studied in the workplace, but what literature does exist is promising as to the value that hope can add for employees. Specifically, positive relationships have been found between leader's hope, profitability, and employee satisfaction and retention (Peterson & Luthans, 2003); employee hope and organizational profitability (Adams, et al., 2002); and manager and employee hope and performance, work related happiness, organizational commitment, and job satisfaction (Youssef, 2004).

Resilience

Psycap resilience is defined as "the developable capacity to rebound or bounce back from adversity, conflict, and failure or even positive events, progress, and increased responsibility" (Luthans, 2002a, p. 702). This definition is expanded from Masten and Reed, who defined resilience in the realm of clinical psychology as "a class of phenomena characterized by patterns of positive adaptation in the context of significant adversity or risk" (2002, p. 75). Luthans extends his PsyCap definition to include rallying after drastic positive changes because these too place substantial amounts of stress and strain on employees, necessitating resilience to keep moving forward and adapting to change. Put simply, any time you are 'positively or negatively pushed beyond some threshold capacity level, you are at the front end of tapping into resiliency' (Luthans, Youssef, & Avolio, 2007, p 121). In PsyCap resilience's definition, additional

emphasis is placed on returning not only to the "normal" baseline self, but to improve and grow after facing adversity. Research has shown that some individuals higher in resilience will move past their previous psychological (e.g. emotional and cognitive) equilibrium points after hardships, resulting in higher levels than previously held (Richardson, 2002; Bonanno, 2004). This possibility of enhancing employees despite difficulty is a very appealing concept for organizations today, as will be discussed later.

Although one typically thinks of situations requiring resilience as hard trials and tribulations that many children faced growing up (e.g. death of a parent or sibling, failed foster care system, abusive relationships), and then overcame despite all odds, many other less tragic situations require resilience. It isn't as rare as it once was thought to be, but rather it stems from the little things all around us each day (Masten, 2001). A variety of factors, both internal and external, have been identified as either having an attenuating or a strengthening effect on the development of resilience (Luthar, Chicchetti, & Becker, 2000; Masten et al., 1990, Werner & Smith, 1982). These factors fall into 3 categories: assets, risk factors (Masten, 2001; Masten & Reed, 2002; Youssef & Luthans, 2005b), and values (Coutu, 2002; Kobsa, 1982; Richardson, 2002; Youssef & Luthans, 2005a).

Assets, also called resources, are defined as measurable characteristics that are predictive of positive results and adaptation to adverse situations. These are numerous and occur in the workplace (e.g. promotions or mentorships) or are more intrinsically located (e.g. cognitive abilities, temperament, positivity, emotional stability (Masten & Reed, 2002), initiative, independence, relationships, creativity (Wolin & Wolin, 2005)). Even PsyCap hope, optimism, and self-efficacy are assets. On the other hand, risk factors are measurable characteristics that cause an "elevated probability of an undesirable outcome" (Masten & Reed, 2002, p. 76). These

"vulnerability factors" (Kirby & Fraser, 1997) are tied to negative outcomes and are predictive of poor adaptation in the workplace (e.g. the potential of having abusive supervisors or possibilities of losing customers). A proactive appraisal of these risks and assets is at the core of Psycap resilience, and the development and minimization of these assets and risks, respectively, are the aim of resilience development interventions (Masten, 2001). It is important to note, however, that over time, assets can morph into risks (Rudolph & Repenning, 2002) especially in fast-paced organizations. Thus, it is important to appraise risks and assets in light of all new information that is relevant. Last, in terms of values, a deeply held system of morals and beliefs contribute to PsyCap resilience by guiding, shaping and providing consistency and meaning for an individual's cognitions, actions, and emotions (Luthans, Youssef, & Avolio, 2007). Having these fundamental ideals to grasp onto in the face of difficulty aids in looking forward to a more positive future. Being able to focus on that potential future is beneficial in motivating the individual to keep moving forward and improving. The importance of this value system has been supported by research in many different circumstances, including psychological (e.g. mental health; Wong & Mason, 2001) and physical challenges (e.g. burn victims, Holaday & McPhearson, 1997). One caveat to these values is that they must be stable and consistent as a source of true meaning in the individual's life (Coutu, 2002).

Resilient people are characterized by a staunch acceptance of reality; a deep belief that life is meaningful, which is often strengthened by strongly held values; and an uncanny ability to improvise in response to momentous change (Coutu, 2002). Adaptability is key for resiliency; it has been thought of as the difference between those who recover well after hardships, and those who remain devastated and derailed (Block & Kremen, 1996; Masten et al., 1985). When these resilient individuals are up against adversity, they are more able to maintain emotional stability

(Bonanno, Papa, & O'Neill, 2001) and adapt to these negative experiences and changes happening around them (Luthans, Vogelgesang, & Lester, 2006). Further, they are open to new experiences and show great flexibility while dealing with varying demands compared to less resilient individuals (Tugade & Fredrickson, 2004).

Little is known about resiliency in the workplace (Sutcliffe & Vogus, 2003); a majority of studies that do exist focused on resilience's relationship with stress resistance. However, early research conducted by PsyCap's founders has established a positive relationship between resilience and workplace outcomes such as job satisfaction (Luthans, Avolio, et al., 2007) and performance (Luthans, Avey, et al., 2006; Luthans, et al., 2005) including longitudinal evidence of a relationship with job performance as well (Luthans, Avey, Clapp-Smith, Li, 2008; Peterson et al., 2011). Now that PsyCap has turned new focus to examining resilience in the workplace, progress is being made to fill this gap in the literature.

Overall PsyCap

Evidenced to be a synergistic effect, where the collective sum of the four dimensions is greater than the individual parts, combining these four constructs appears to be quite valuable. Specifically, overall PsyCap has higher correlations with performance outcomes than the individual components alone – an effect that can be explained by recognizing the shared psychological mechanisms found in each of the four dimensions (Avey, Avolio, & Luthans, 2011; Luthans, Avolio, et al., 2007). This then augments the joint psychological resources related to positive motivational resources. Luthans et al (2007) described this commonality as a "positive appraisal of circumstances and probability for success based on motivated effort and perseverance" (p. 550). The result provides an individual with a reservoir of motivation and inspiration to draw from as needed. The four variables have also been shown to be positively

correlated (Luthans, et al., 2007). When looking at each piece, the interwoven characteristics make sense. For example, if we are optimistic, we also will most likely feel more confident in our ability to succeed, which could contribute to creating more challenging goals. As we experience hope to succeed in this goal, it has two important consequences: multiple strategies to proactively overcome impediments and a sense of inspired agency that supplies us with goal directed energy. At the same time, self-efficacy also gives us the urge to push on because we know we can do this – we believe in our abilities. Additionally, a sense of optimism also generates positive expectations of the outcome, and resilience gives us the vigor we need to persist further after experiencing some setbacks, which would most likely mean taking advantage of the pathways generated from hope. This resource of goal-striving vitality, stemming from the four dimensions, helps to maintain an internalized sense of control and purposefulness during goal pursuit (Luthans, Youssef-Morgan, 2017).

Based on the example above, it would be understandable to think that there is substantial overlap between the four constructs - self-efficacy seems to be crucial for success in the other three, resilience plays off of hopes pathways, an optimistic appraisal is necessary when coming up against adversity – however, discriminant validity across the individual PsyCap dimensions has been established (Luthans, Avolio, et al., 2007; Luthans et al. 2007) indicating that each individual component contributes unique variance as it is added to overall PsyCap. Discriminant validity of hope, self-efficacy, resilience, and optimism has also been demonstrated outside of the conceptualization of PsyCap in the positive psychology literature as well (Alarcon et al. 2013, Magaletta & Oliver 1999). The synergy of these four dimensions of psychological capital, in addition to human, and social capital, could be crucial to optimizing employee potential (Luthans, Youssef, & Avolio, 2007).

Developing Psychological Capital

The ability of hope, self-efficacy, resilience, and optimism to be developed was among the most important POB criteria to be met for inclusion as a positive psychological capital resource. Longitudinal studies have established variability in PsyCap over time (Avey et al., 2010; Peterson et al., 2011), and relatively short training interventions (Dello, Russo, & Stoykova, 2015; Demerouti et al., 2011; Ertosun et al., 2015; Luthans et al., 2006a, 2008, 2010, 2014) have shown empirical support for PsyCap development, including in an online setting (Luthans et al., 2008). Additionally, in a more general sense, it is important to note that interventions to increase positivity and decrease negativity have been successful in positive clinical psychology (Sin & Lyubomirsky, 2009), and it has been established that about 40% of positivity is deemed to be under the control of the individual, thus allowing for purposeful development and improvement (Lyubomirsky, 2007).

Previous conceptualizations of hope (Snyder et al., 1991), self-efficacy (Judge & Bono, 2001), optimism (Scheier & Carver, 1987), and resilience (Block, 1961), as traits can generate substantial confusion as to their developmental nature though. To aid in understanding, Luthans, Youssef, and Avolio (2007) conceptualized the plasticity of psychological constructs and resources as if on a trait-state continuum. Found on one extreme are pure state constructs that are fleeting, such as momentary feelings and moods, and on the other end of the spectrum are the hard-wired, virtually unchangeable traits such as intelligence, abilities, and heritable characteristics. In between these two endpoints fall less severe versions of each: state-like and trait-like conceptualizations of constructs. Located after pure states are state-like constructs, the classification given to PsyCap's hope, resilience, self-efficacy, and optimism, which are still malleable and open to development, but substantially more stable than pure states like moods.

Moving past state-like constructs leads to the trait-like constructs that are relatively stable and quite difficult to change like core self-evaluations, virtues, and the Big Five personality dimensions. Beyond this point lies the true fixed traits.

Evidence such as PsyCap's lower test-retest reliability (0.52) compared to traits such as conscientiousness (0.76) and core self-evaluations (0.87) as well as evidence from other studies (Luthans & Youssef-Morgan, 2017) have supported PsyCap's classification as a state-like construct (Luthans, Avey, Avolio, & Peterson, 2010). This status is crucial due to 1) the plasticity needed to develop higher levels of positivity, which differentiates it from a pure state, and 2) the sustainability and stability necessary for that improvement over time to be valuable to put effort into changing. If every employee is going to return to their baseline at the end of the day or week, then that is substantially less exciting and useful than if the results last for months. Importantly, although this question of sustainability was noted in 2007 (Luthans, Youssef, & Avolio), few longitudinal studies have been conducted, and more research is needed in this area; two of those that exist have only examined follow-up PsyCap levels at three days after the intervention (Luthans, Avey, & Patera, 2008; Luthans, Avey, Avolio, & Peterson, 2010). The third study did measure the post-intervention PsyCap level after 8 weeks (Luthans, Luthans, & Avolio, 2014), and the participant's PsyCap score was higher than the baseline at this point. Another exception is a longitudinal study conducted by Williams, Kern, and Waters (2015). While there was no intervention, PsyCap measurements were taken at three time-points with roughly 6 months between each measurement. Mean PsyCap levels for the sample showed steadiness from time one (M = 4.75, SD = 0.63), to two (M = 4.77, SD = 0.62) to three (M = 4.81, SD = 0.55). This evidence does support the idea that PsyCap is relatively stable but does not shed much light on the effectiveness of interventions in terms of the longevity of the results.

It is this distinction between state and trait that allows PsyCap to encompass the idea of moving from a person's actual self in terms of human, social, and psychological capital, to what they aspire to become (Avolio & Luthans, 2006). The ability for organizations and individuals to enhance PsyCap has promising implications for all parties involved.

Distinctions from similar constructs. The supported state-like developable quality of PsyCap is the distinguishing feature that separates it from other similar trait and trait-like constructs. Of the four PsyCap constructs, self-efficacy is most clearly classified as state-like, again indicating it is open to development. However, it can also be trait-like; one of core self-evaluation's dimensions does include self-efficacy, which is specifically referring to trait-level generalized self-efficacy applying to everything a person does, as compared to situation-specific PsyCap self-efficacy. The same duality exists in the other three constructs too, as they consist of both stable trait levels and developable state levels of each. Hope (Snyder, et al., 1991) and optimism (Carver & Scheier, 2002) have been recognized as dispositional personality traits but have also been demonstrated to be learnable and developable states (Snyder, et al., 1996; Snyder, Tran, et al., 2000; Veninga, 2000; Luthans, Avolio, et al., 2007; Luthans, Avey, et al., 2010). Additionally, resilience used to be thought of as a rarity (Sutcliffe & Vogus, 2003) that was more of an engrained trait, but research has shown that people can become substantially more resilient over time (Vaillant, 1977, 2000; Coutu, 2002), indicating a state-like developmental conceptualization of the construct as well. Hardiness, referring to the ability to withstand adverse conditions, is a very similar construct to resilience, but the former is a personality trait (Bonanno, 2004) and does not allow for enhanced adaptive outcomes like the latter. Self-esteem is sometimes thought to be akin to self-efficacy, but self-esteem is a much more affective inwardly-focused trait described as 'a trait referring to individuals' degree of liking or disliking for

themselves' (Brockner, 1988, p. 11), whereas self-efficacy captures the belief that one is confident they can achieve a task.

A Competitive Advantage. PsyCap's resources of hope, self-efficacy, resilience, and optimism could be a key component for success in today's organizations. Barney (1991) set the criteria for what constitutes a resource that can contribute to a sustainable competitive advantage; it must be valuable to the organization, it must be rare, and it must be inimitable and non-substitutable. If an asset meets these conditions, an organization has the opportunity to leverage it in a value-creating strategy. When this value-creating strategy is unique to that organization, with no other organization succeeding in copying it, then it can be said that the organization has a sustained competitive advantage (Barney, 1991). In a world where business is continually becoming more fast-paced, and where technological advantages in products hardly exist (just look at how similar competing smart phones, cars, or laptops are), this idea is incredibly important. The workplace can be a volatile and highly competitive, for both employees and employers. Organizations have had to turn inward and focus on the value their employees can bring to their competitive strategies. Human and social capital have been utilized in this way for decades (Barney, 1991), and now psychological capital provides an even more exceptional asset to organizations. These resources meet Barney's above requirements of being rare, valuable, unique, and not substitutable, and they go even further by encompassing a futuristic outlook revolving around who your employees are and what they can become. It allows employees to "act with different capacities" to meet the dynamic expectations of the workplace (Luthans, Youssef, & Avolio, 2007), thus ready to face change and anything the business world could throw at them.

As we sit on what some would consider to be the brink of a new industrial revolution (Maynard, 2015; Peters, 2017; Schwab, 2017), change may be the only thing that will remain constant. Very turbulent times could be ahead; according to new projections, roughly half of work activities conducted by employees could be automated by 2030 (Manyika, Lund, & Chui, et al., 2017). This will require substantial changes for all workers and organizations in the future, changes from which even the most caring and stable organizations can't protect their employees. It was recently estimated that up to a third of American jobs, affecting 73 million people, could be claimed by the impeding advancements of artificial intelligence (AI) and automation. The report stated that 'the transitions will be very challenging - matching or even exceeding the scale of shifts out of agriculture and manufacturing we have seen in the past' (Manyika, Lund, & Chui, et al.). If an organization has employees that could look ahead and positively see a potential for success despite unfamiliar circumstances that may be approaching (optimism), who will confidently take on challenging goals (self-efficacy) and believe in their ability to succeed, who are resolute in persevering towards those goals even if barriers are reached and a different path must be taken to succeed (hope), and that are so resistant to defeat that they grow and improve despite hardships (resilience), it would surely be considered a sustainable competitive advantage.

In addition to future-oriented advantages, organizations can reap the benefits of investing in employee PsyCap today. As mentioned previously, because the facets are all state-like in nature and don't stem from personality traits, they are open to development, and evidence-based research is showing encouraging results for organizations that take time to invest in their employee's psychological capital. A previous meta-analysis by Avey, Reichard, & Luthans (2011) supported past findings showing PsyCap is positively correlated with a myriad of desirable employee characteristics, such as attitudes (psychological wellbeing, organizational

commitment, and job satisfaction), behaviors (citizenship), and different measures of performance (supervisor evaluations, self, and objective). PsyCap was also negatively related to unwanted employee behaviors (deviance) and attitudes (anxiety, turnover intentions, cynicism, job stress). Other findings have shown PsyCap has a positive relationship with problem-solving performance and reported innovation (Luthans, Youssef, and Rawski, 2011), self-reported performance (Chhajer, Joseph, & Rose, 2016), and creative performance as well (Sweetman, Luthans, Avey, & Luthans, 2011; Rego et al., 2012).

An employee's PsyCap does not only affect the organization though; the work environment also contributes to an employee's psychological capital. Avey (2014) found that not only individual differences like self-esteem and core-self evaluations, but also job characteristics such as task complexity and supervision like empowering leadership, all impact an employee's PsyCap, and thus these aspects of the job can be altered in a way that enhances it. This indicates that between organizational characteristics and employee trainings, organizations hold great power to influence employee PsyCap.

Developing self-efficacy. To enhance PsyCap self-efficacy, individuals must have opportunities to engage in efficacy-building experiences. The ways these opportunities present themselves for employees are not overly important, as these can take the form of ultra-specific microinterventions (Luthans, et al., 2006) or basic initiatives (Avolio & Luthans, 2006). Based on Bandura's (1997) research, these efficacy-building experiences include 1) Mastery experiences, 2) Vicarious experiences, 3) Social persuasion, and 4) Physiological and psychological states.

Mastery experiences occur when repeated successes are gained for the task you are working on. This is the best way to enhance self-efficacy, as success builds up confidence in

what achievement is being attempted. Larger tasks can even be broken down into micro-tasks so that more little successes can be attained (Luthans, Youssef, & Avolio, 2007). This forms a sort of upward spiral, in which success leads to increased self-efficacy, which leads to higher performance, and so on. One caveat does exist though; if the employee does not feel that they earned the success, they will not gain from it in terms of self-efficacy (Bandura, 2000).

Vicarious experiences provide an individual who may not be able to get hands-on practice with an opportunity to still gain confidence regarding a task. By observing a role model who is successfully conducting the task, an employee can learn how to better execute the task themselves. They can also learn what doesn't work well if they observe the role model failing or struggling, but this can also make the observer doubt their own capacity to succeed. This type of self-efficacy building works best if the role model is very similar to the observer. If employees see others like them succeeding through sustained effort at the task they are going to attempt, it brings them to believe that they too can achieve this as well; the same pattern is true for failing, though (Bandura, 1999).

Social persuasion relies on those around you to help build your confidence. If a respected and intelligent colleague encourages and persuades you that you can indeed succeed at a task, it can help to develop your self-efficacy after you see that others believe in you. Just like a self-fulfilling prophecy, by believing their assertions, you too enhance your belief that you are capable of what you set out to achieve. Conversely, this also works even more powerfully to strip an employee of their self-efficacy if that employee is degraded by others and is told that they cannot achieve what they have set out to do (Bandura, 1997).

Physiological and psychological states play an important role in how we assess our capabilities, particularly when we are feeling bad. If we have negative feelings, either physically

or mentally, our confidence takes a blow and is temporarily lower than if we were feeling great. Being in a positive psychological or physical state can shift the employee's perspective to be more positive about what they can accomplish. Of the four efficacy-building experiences, this has the smallest impact. It is important to manage and be aware of due to the harmful effect that negative states have on our confidence in ourselves though (Bandura, 1997).

Developing optimism. Developing realistic optimism in the workplace can be done by changing negative explanatory styles or enhancing the facets of a positive explanatory style. These methods involve the integration of three perspectives outlined by Schneider (2001); leniency for the past, appreciation for the present, and opportunity seeking for the future. To have leniency for the past entails the use of a method of positive reframing that highlights the realities of a situation. The aspects of the situation that are under the control of the individual are tackled using a problem-centered coping approach, while what is out of the individual's control is perceived "in the best possible light" (Carver & Scheier, 2002). Framing a negative event in a way that views it as having high consensus (this has happened to people other than just me), low consistency (this is something that hasn't ever happened/ has barely happened before), and high distinctiveness (I performed fine in all other areas except this one; Kelley, 1973) aids in attaining an optimistic explanatory style, which again should still be accurately and realistically based. Typically, much of this kind of information is withheld from employees though to keep from "demotivating" them; this is quite counterintuitive though, as purely negative feedback is very demotivating. Continuing to the next perspective, appreciation for the present pulls one's attention away from the negative aspects of the situation and instead highlights the good that is still occurring regardless of the bad. This can help prevent a pessimistic attitude from developing. Finding the good in a situation can be as easy as thinking of what did go well in

terms of safety, quality, team relationships, or also being grateful to have a job and supportive supervisors. Last, opportunity-seeking for the future employs a mindset that frames the individual and their aspirations as a work in progress. By being aware of the need to continually improve and work towards what you want to eventually be, it becomes much easier to find and participate in opportunities for growth. This mindset of continuous development in a manager or supervisor can benefit many around them as these supervisors will be emphasizing the development of their followers too. These individuals who are high in optimism aren't likely to become complacent, but rather will focus on challenging themselves continually.

Developing hope. One particular piece of hope's two-pronged definition, pathways (waypower), provides a tangible means for this construct to be enhanced in employees. The initial developers (Luthans, Youssef, & Avolio, 2007) of the PsyCap construct have adapted specific guidelines, based on the work of Snyder (2002), that can be utilized to build hope. These revolve around building up a solid foundation to utilize during your pursuit of challenging goals. The first guideline involves setting clear and challenging goals that are specific in terms of quantity and deadlines (Locke & Latham, 1990). These goals should be hard, but not so hard that failure is imminent, especially if hope is very low in the first place. Second, it is advised to set stretch goals that are just beyond the trainee's current capabilities but are still achievable, so that building hope can occur before tackling more difficult challenges. The third guideline uses the "stepping method" to identify the microtasks and smaller steps that make up the whole goal. The aim of striving towards each of these smaller pieces is to allow the individual to feel as though they are making progress and achieving miniature successes as they work toward the ultimate goal. The next guideline calls upon the "pathways" dimension of hope. It suggests that barriers to success be examined, and an alternate action plan to be developed. An alternate pathway should

be thoroughly planned and given serious thought, thus allowing the individual to become more familiar with the process of pivoting to a new plan in the face of obstacles. It is also advised that the individual should aim to find some satisfaction in the process of goal pursuit rather than only focusing on the final success. Further, the challenge of obstacles and problems is also emphasized. With more hope, the individual has greater amounts of goal-directed energy to expended (Luthans, Avey, et al., 2008), and paired with a willingness to create alternate pathways, they are likely to be much more persistent during goal pursuit. Another guideline stresses the importance of choosing alternate paths wisely. Working through "what if" scenarios during the planning stages of goalsetting will allow for better preparation when making this decision. Last, individuals need to recognize when they have false hope. This is not the same as giving up, but rather, it is realizing that when working towards a goal is futile, it is better to acknowledge this and "re-goal" rather than to keep trying alternate pathways. Carefully and realistically examining the goal will allow for more informed and skilled decision making regarding ending the pursuit of a goal (Luthans, Youssef, & Avolio, 2007).

Some guidelines are also focused on characteristics of the organization. From an organizational perspective, employees should be involved, engaged, and empowered by participating in communication and decision making, and providing them with opportunities to increase autonomy. Employees who are supported in this way can exercise agency because they have the freedom and authority to do so. They are likely to initiate and implement plans to pursue their goals, which allows for the pathways dimension of hope to be utilized (Luthans, Youssef, & Avolio, 2007). Further, organizations also need to acknowledge the need for resources that are involved in developing hope. These include the physical material resources required for the pursuit of the goal, but more importantly, this also includes the support and

commitment of the leaders and the organization as a whole. Yet another facet of an organization is important to the growth of employee hope; appropriate reinforcement through reward systems. Organizations need to have systems that reward the appropriate agency and pathway behaviors, including goal setting, persistence, and contingency planning. A focus should be placed on rewarding employees and managers who involve themselves in goal setting initiatives, contribute to goals, and devising multiple plans of action to accomplish the goals. Finally, culture and climate are key factors in developing and sustaining hope. By emphasizing long-term goal setting (including multiple pathways) at an organizational level, facilitating the achievement of employee goals, enhancing and maintaining employee's willpower and waypower, and utilizing high-engagement management techniques (e.g. high levels of communication, empowerment, inclusive decision making), the hope development techniques utilized for leaders, managers, and employees have a much greater chance of successfully lasting the test of time than organizations with unsupportive, unaligned climates and cultures (Luthans, Youssef, & Avolio, 2007).

Developing resilience. Although less thoroughly researched and established for resilience than for self-efficacy and hope, there are still evidence-based lessons to be learned regarding the development of resilience. Luthans, Vogelgesang, & Lester posited that two approaches - one proactive and one reactive - should be taken to enhance resilience (2006). The proactive approach centers on the idea that resilience will most likely be needed. Thus, it is better to build resilience and be able to adapt more readily than assuming one won't need resilience. Three strategies stemming from Masten & Reed (2002) are considered in this approach: Asset-focused, Risk-focused, and Process-focused strategies.

Asset-focused strategies revolve around an individual becoming more aware of the assets and resources that are available to them. Increasing the perceived and actual amount of assets can

make positive outcomes much more likely during challenging times (Masten & Reed, 2002). Perceptions of this are important because an individual might not be aware of what they have at hand. By facilitating open discussion about possible assets, this insight can be widened. As for increasing the amount available, many avenues exist. Considering that both human and social capital, as well as the other three PsyCap dimensions (hope, optimism, and self-efficacy) are assets that can be leveraged, it is relatively easy to enhance these areas. Human capital development (e.g. KSA's, experience) is responsive to traditional training and development, social capital can be developed through trust-building, team-building, open communication, authenticity, transparency, work-life balance initiatives, and feedback and recognition (Luthans & Youssef, 2004; Youssef & Luthans, 2005a, 2005b), and PsyCap's other dimensions can be enhanced as described above.

Risk-focused strategies take prevention quite literally by aiming to reduce the likelihood of undesirable outcomes. This approach does not condone risk-avoidance; rather, it states that risks should be managed and evaluated as opportunities for development (Luthans, Vogelgesang, & Lester, 2006), which helps to diminish the stress involved in the situation. This requires alignment with the theme of positive appraisal that runs through PsyCap's dimensions. For example, consider two job offers, one with a well-established company, more stability, and good pay – a job with which you would be happy and productive in, and one with a very new company that is growing rapidly, has rather undefined roles, more responsibility and uncertainty, but would potentially be a position in which you could flourish. This strategy is not encouraging the individual to go with the safer option, but rather, to assess the risks, and if appropriately manageable, then go with the riskier offer and to view it as an opportunity for growth and development. Appraising some risks as worthy of avoidance is alright though, especially when

an individual's health and wellbeing is in question. Examples include proactively avoiding adversity or paying heed to the health detriments stemming from long and stressful workdays where you are spending hours upon hours sitting down.

Process-focused strategies rely on the cognitions of the individual and aim to combine the first two strategies into "effective adaptational systems and processes" (Luthans, Youssef, & Avolio, 2007). The goal is to appraise the adverse event, taking stock of what can be utilized. These strategies aid in recognizing and choosing pertinent assets and risks, as well as to then develop and utilize them. Specifically, self-awareness and self-regulation are strategies that help in maintaining a balanced mix of assets when managing risks to allow for growth and progress during times of adversity. It is important that an individual appraises their assets accurately (self-awareness) and monitors the deployment of these to effectively overcome risks (self-regulation). Without this insight, remaining resilient is quite difficult.

The reactive approach to resiliency development stems from Fredrickson's broaden-and-build model of positive emotions (2001). This model emphasizes the importance of consistency in attaining a more positive thought process, including finding meaning in negative events. By incorporating this reminder into conversations daily, organizations can aid in expanding employees' capacities to positively appraise challenging and worrisome events. It is also very important to maintain a healthy appraisal of events; unwarranted internal attributions of failure are much less productive as they can be quite demoralizing. Rather, realistic accurate attributional styles would allow individuals to adapt to stressful situations more quickly because they are less preoccupied with the negative emotions that are tied to internal attributions (Bonanno, 2004).

Additionally, organizations can aid in resiliency development. Sutcliffe & Vogus (2003), highlight the importance of organizational values to give employees a stable foundation to look to in times of hardship. These values can aid in grounding employee resiliency, just as an individual's personal values are crucial to being resilient. Other organizational facets such organizational alignment and learning, strategic planning, and corporate cultural awareness can also substantially enhance employee resilience throughout the organization (Horne & Orr, 1998). Organizations can aim to develop healthy psychological contracts with employees that are grounded in ethical values, allowing trust and reciprocity to build (Luthans, Vogelgesang, & Lester, 2006). This minimizes risks to the employee and enhances the opportunity to develop more assets through a supportive corporate culture.

Psychological capital interventions. There are more than a few shared commonalities among strategies for enhancing the different PsyCap dimensions, all stemming from Fredrickson's (2001) broaden and build theory of positive emotions and Hobfoll's (2002) psychological resource theory. It is based on a "positive appraisal of circumstances and probability for success based on motivated effort and perseverance" (Luthans et al. 2007, p. 550). The intersections allow multiple dimensions to be built upon simultaneously, which is a method purported to be more effective than addressing each construct's development individually in positivity-increasing interventions (Seligman et al., 2005, Sin & Lyubomirsky, 2009). Youssef-Morgan and Sundermann (2014) identified key guidelines to effectively conduct these positive workplace interventions, often called Psychological Capital Interventions (PCIs). These trainings are roughly 2-3 hours long and are meant to be adapted to the audience at hand. Fundamental to PsyCap development is a need to change deep-rooted assumptions and beliefs that are negatively based into a much more positive style of thinking. Thus, it is important to remember that the

environment must also support the employee in terms of autonomy, support, structure, leadership, team dynamics, and available resources for PsyCap to be developed successfully and maintained over time (Petersen, 2015).

Interestingly, no study has explicitly tested whether the positive outcomes resulting from the above recommendations laid out for increasing hope, self-efficacy, optimism, and resilience actually operate through the enhancement of each dimension, whether that be by working wholly or partially through PsyCap. Future research should look to separate the effects of these recommendations from the effects of what is presumably being enhanced.

PsyCap Profiling

As more emphasis is placed on developing an employee's PsyCap, great value and precision could be added by knowing the level of each separate component of the construct. Unfortunately, the standard measure of PsyCap, the PCQ-24 (Luthans, Youssef, et al., 2007), states that a composite score should be utilized, rather than specific values for each level of the four dimensions. As with any aggregation, important information is lost when the parts are summed. For example, if two employees both have a high composite PsyCap score, this does not mean that they were equal in each dimension too. One could have had high scores across all dimensions, and the other could have scored very high on self-efficacy and optimism, but rather low on hope and resilience. By identifying these strengths and weaknesses, constructive developmental feedback could be given and specific trainings could be implemented targeting the specific deficits of each individual. Even though the constructs are related, it is conceivable that individuals will differ across the four components, since they are postulated as separate from one another (Luthans, Avolio, Avey, et al., 2007) and it is very plausible that PsyCap profiles

could exist and may result in different relationships with performance as well as other outcome variables (Dawkins, Martin, Scott, & Sanderson, 2013).

Currently, no research exists to examine the different constellations that could be found in these four dimensions. As an answer to this call for research (Luthans & Youssef, 2017; Dawkins et al., 2013) the purpose of this study is to fill this gap in the literature by seeking to identify possible profiles of PsyCap. By determining typologies of employees who have different PsyCap configurations, we will be able to better understand how relevant relationships with PsyCap might be different. For instance, in a study by Rego and colleagues (2010) examining neutralizers of the PsyCap – performance relationship, self-efficacy and hope's waypower dimension were not significant predictors of performance, but hope willpower, optimism, and resilience were. This indicates that we don't understand what contextual factors might be negating relationships to performance, and under what circumstances yet. This study led to valuable propositions regarding potential variables that could have lessened the association between self-efficacy and hope pathways and performance. These variables were specific characteristics of the performance appraisal system in place. Examples given by Rego and colleagues included that frequent feedback is a necessary component of the self-efficacy and work performance relationship (Kuvaas, 2007), and this appraisal system only gives feedback to employees on an annual basis. Further, since high-self-efficacy individuals may set more challenging goals for themselves than those low in self-efficacy (Locke & Latham, 1990; Bandura, 1997), this could increase the risk of failing at reaching their performance goals, and thus result in negative consequences and poor evaluations from their supervisors. Thus, the authors postulated that high self-efficacy individuals may set easier goals to lower the risk involved with striving towards challenging goals. Again, this highlights the need to move away

from examining PsyCap as a composite construct only, and instead examine the effects of each dimension too. Paired with Avey's (2014) study of the antecedents of PsyCap, it is possible that specific antecedents will be related to certain profiles. These profiles may then be able to indicate areas in organizations that need attention, almost like a diagnostic tool using PsyCap profiles as symptomatology to direct interventions toward target symptoms (e.g. turnover).

Profile presence. Regardless of how beneficial a person-centered analysis of PsyCap might be, there is no guarantee that any profiles will be found. Many similarities exist in PsyCap's dimensions. Positive appraisals that run through PsyCap's hope, self-efficacy, resilience, and optimism, could equally affect each component in a way that attenuates or augments the levels of all equally. Moreover, all four components utilize probability for motivation- and effort- based success (Luthans et al., 2007), and they share conation as a motivational driver for action as well. It is also probable that the integrated method of most effectively enhancing the four components (Luthans & Youssef-Morgan, 2017) poses the assumption that these four are inextricably linked, and when enhancing one construct, the other resources are built up as well (Hobfoll, 1999). Further, the positive relationships among the variables make it questionable for distinct profiles to form, since it seems that some negative relationships would be necessary to have different profiles that are not just all high, all medium, and all low levels of the four components across the board. Additionally, the psychological resource theories that PsyCap is based on, namely Conservation of Resources (COR) theory (Hobfoll, 2001) and more specifically Hobfoll's idea of "resource caravans" (Hobfoll, 2002), posit a downward spiral of resource loss since dealing with one job demand can possibly lessen a person's ability to cope with another job demand needing attention at that same time (Hobfoll, 2001). This draining of resources during a time of high job demands would result in little

variation in the dimensions of PsyCap. For example, as previously mentioned, hope, self-efficacy, and optimism are considered assets that can be utilized during resilience, and these resources would follow a pattern where higher levels would be more beneficial for the individual's resiliency. To increase resilience, research shows that building up assets is an effective means of development, meaning that if you build one, you build all. Therefore, if an individual has low levels of resilience, it could also indicate that their other assets are depleted, which would include having low levels of hope, self-efficacy, and optimism too. Thus, it is quite possible that no meaningful profiles will be identified.

Conversely, it is possible that certain factors at work could impact each of the four PsyCap constructs differently, thus allowing qualitatively different profiles to emerge. Currently, PsyCap theory alone does not take a holistic perspective of the employee in that it focuses only on resources rather than also considering what causes those resources to be utilized. Some have noted the importance of looking at antecedents of PsyCap to understand the key factors impacting a person's inventory of positive resources (Luthans & Youssef-Morgan, 2017). As mentioned above, evidence has shown organization-level characteristics such as supportive organizational climate and leadership styles, as well as job-level constructs such as job characteristics, impact people's levels of PsyCap (Avey, 2014). Much more research is needed to better understand the antecedents of PsyCap. Fortunately, some well-established resource theories can lend a hand in forming a better understanding of this person-environment relationship. Job Demands-Resources (JD-R) theory (see Bakker & Demerouti, 2014 & 2017 for an in-depth overview) does take a more complete approach, and it allows for a better understanding of how motivation factors and stress factors combine to impact employee wellbeing, which includes work engagement, health, motivation, and burnout, as well as an

employee's job performance (Bakker & Demerouti, 2014). This could help provide a theory-driven explanation if profiles are found.

JD-R theory (Bakker & Demerouti, 2014) posits that any job can essentially be broken down into two different categories: job demands and job resources. Job demands are the aspects of the job that require effort, including social, physical, or organizational demands, and that come at some sort of a cost, whether that be physiological or psychological. Examples include high levels of work pressure, job ambiguity, computer problems, or dealing with demanding clients. Further, these demands don't have to be inherently negative, but rather just need to take high effort (Bakker & Demerouti, 2014). Job resources refer to those physical, psychological, social, or organizational aspects of the job that take three roles; they are "functional in achieving work goals", they "reduce job demands and the associated physiological and psychological costs", and they "stimulate personal growth, learning, and development" (Bakker & Demerouti, 2007). As this definition shows, resources are important in and of themselves, as well as being necessary to manage job demands. Hope, self-efficacy, optimism, and resilience fall into this category of job resources and are specifically called personal resources . JD-R theory states that personal resources serve as a means to buffer the negative effects of job demands, as these are usually the aspects of the self that are linked to resiliency (Bakker & Demerouti, 2014).

Job demands and resources initiate two distinct psychological processes. The first demonstrates the health impairment process, showing that consistently high levels of job demands can be detrimental to an employee's health by draining energetic resources, leaving an exhausted employee to face health problems. This negative effect then goes on to impact organizational outcomes. On the other hand, the second psychological process emphasizes motivation. Specifically, if an employee has job resources, these can be utilized to support them

in reaching their job-related goals; having resources turns job demands into challenges that can be completed. These positive effects then impact organizational outcomes (Bakker & Demerouti, 2014). When you think of job resources as including colleague support and help, and supervisor feedback, as well as personal resources like those in PsyCap, the benefit that an employee with resources has over one with depleted resources is quite apparent. Interestingly, evidence has shown that job demands are typically the most important predictors of negative employee health outcomes (Bakker, Demerouti, & Schaufeli, 2003; Bakker & Demerouti, 2014), and job resources are the most important predictors of positive employee constructs such as work enjoyment, engagement, and motivation (Bakker et al., 2007, 2010).

JD-R Theory also has shown repeated support for some important interaction effects. Job demands and job resources have been shown to interact in predicting occupational wellbeing in two specific ways. First, job resources have been shown to buffer the impact of job demands on strain (Bakker, et al., 2005), giving a coping advantage to employees with resources. Second, job demands can augment the effects of job resources on motivation, meaning that employees are more aware of the strategic value of their resources when their job demands are high (Bakker & Demerouti, 2014; Hakanen, Bakker, & Demerouti, 2005). Thus, the two separate mechanisms at play in JD-R theory, as well as the possible interactions, could mean that a number of factors in organizations could differentially affect the various levels of employee hope, resilience, optimism, and self-efficacy. For example, if someone is dealing with high job strain, which is characterized by high levels of job demands and low job control to utilize resources to solve the problems, someone could feel very efficacious about their ability to complete their tasks, and quite resilient about pushing on in the face of this difficulty, but they could be low on optimism and hope because they don't feel that they have the control over their job to make a change that

will actually fix the issue. This hypothetical profile of high self-efficacy and resilience, and low optimism and hope could perhaps be shared by other employees who are experiencing the same type of job strain. In this way, JD-R Theory can serve to provide a theoretically backed explanation to any potential profiles that may surface.

The identification of profiles through the use of Latent Profile Analysis (LPA) would be a welcomed addition to the variable-centered approach to examining PsyCap. A person-centered approach brings attention to each individual dimension. This reduces the tendency to aggregate PsyCap dimensions in analyses and promotes relationships between the four constructs and the dependent variable of interest to be more fully examined, thus further refining PsyCap theory. The dimensional focus also allows for more personalized feedback and learning opportunities for employees. Practically, having a better understanding of types of employee profiles that can exist within an organization creates a few unique opportunities. For example, PsyCap interventions targeted toward groups could be much more customized if the profile makeup of the audience was known. Further, as more research is conducted on antecedents of PsyCap, and antecedents of profiles if any exist, it is possible that profiles can serve as an indicator of areas of need in an organization, as JD-R theory taps into characteristics of the employee's work environment. Thus, it is important that research be conducted examining the existence of profiles in PsyCap. This study seeks to answer the research questions proposed below.

Research Question 1: Will applying Latent Profile Analysis to the PsyCap data result in distinct profiles consisting of varying levels of the four dimensions?

Research Question 2: Will JD-R theory provide a framework for explaining any differences in profiles?

Latent Profile Analysis (LPA)

This probability-based technique was conducted in this study for its usefulness in identifying subgroups within large, heterogeneous populations (Tein, Coxe, & Cham, 2014). LPA's main objective is to split data that appears to be similar into homogeneous subgroups. The sample utilized for data collection is assumed to come from a population that does indeed contain unobserved subgroups (Meyer, Stanley, Vandenberg, 2013). Attention is given to patterns among individuals' responses, including information regarding the mechanisms of the intricate system of variables within individuals. By classifying interactive effects as profiles, an otherwise complex relationship can be condensed into an understandable summary (Herzberg & Roth, 2006; Robins, et al., 1998) and individuals can be observed in a much more holistic manner. Additionally, given the lack of research regarding PsyCap profiles, LPA's inherently exploratory nature is beneficial in this study. Some argue that this is concerning (Baur & Curran, 2003, 2004), although others take the stance that it is much more appropriate to explore rather than to confirm groupings of similar patterns of scores among employees, particularly when theory is lacking clear guidance (Mun, Bates, & Vaschillo, 2010).

Further, LPA was chosen for this analysis due to its superiority over cluster analyses in distinguishing latent taxonomy (Cleland, Rothschild, & Haslam, 2000; McLachlan & Peel, 2000). Cluster analysis is another person-centered technique (Tryon, 1939). To extract clusters, it aims to minimize within-cluster variation and maximize between-cluster variation (Everitt, Landau, & Leese, 2001; Kaufman & Rousseeuw, 2005). When determining the number of final profiles, which are biased towards producing clusters of equal size (Meyer, Stanley, & Vandenberg, 2013), the available statistics like pseudo F-statistics aren't useful for all types of data (Milligan & Cooper, 1985) thus, they are quite subjective means of decision-making.

Although cluster analysis has fewer limitations than midpoint splits (see Butts & Ng, 2009; Maxwell & Delaney, 1993), which is another person-centered approach not considered for this analysis, this lack of rigor is why LPA is gaining popularity, and why it was utilized in this analysis.

Chapter 2 - Method

Sample and Procedure

A total of 1,017 participants completed a Qualtrics survey via an online participant platform called Mechanical Turk (MTurk). All participants were required to work a minimum of 40 hours per week, hold non-supervisory positions, and fluently speak English. The sample was almost equally made up of both sexes (47% female) and had an average age of 36 (SD = 9.17). A vast majority were college educated, with 56% of participants holding an Associate degree (12%) or a Bachelor's degree (44%), and 22% holding a Masters (20.7%), Doctoral (.8%) or Professional degree (1.5%). Participants were employed in a variety of industries, with 75% being in the service sector, and 90% of the individuals working over 40 hours per week (6.4% worked 30-40 hours per week). The 37 individuals who worked less than 30 hours a week and the 5 individuals who didn't respond to this question were excluded from the analysis from this point forward, leaving the final number of participants at 975. Participants who gave adequate attention to the survey were paid $2.50 as compensation for roughly 15 minutes of their time.

Measures

Psychological capital. This study utilized the PCQ-24 (Luthans, Avolio, et al., 2007), the primary instrument used in the measurement of PsyCap. Consisting of 24 self-report items, with six tapping into each of the four components, it was adapted from previously validated measures of hope, self-efficacy, resilience, and optimism. Each item is rated on a 6-point Likert-type scale

(strongly disagree – strongly agree) and all PsyCap dimensions have reliabilities well above conventional standards ($\alpha > .88$; Luthans, et al., 2007). See Appendix B for sample items. Demographic information was also be requested. Participants were asked to provide their age, sex, education level, number of hours worked per week, and what industry they primarily work in.

Job satisfaction and core self-evaluations. To ensure that the PCQ-24 functioned as expected, two additional measures of job satisfaction and core self-evaluations were included in the study, as previous research has provided evidence of strong positive relationships between PsyCap and these two construct. Core self-evaluations was measured using Judge and colleagues (2003) twelve item scale ($\alpha = .81$), and overall job satisfaction was measured using Agho et al's (1992) six item measure ($\alpha = .83$ to .90). For both scales, responses were recorded using a 5-point Likert scale (strongly disagree to strongly agree).

Job demands and resources. Job demands and job resource resources were measured using the Job Demands-Resources Scale (JDRS) (Rothmann, Mostert, & Strydom, 2006). The JDRS consists of 48 items tapping into aspects of an employee's job such as pace and amount of work, mental load, emotional load, variety in work, opportunities to learn, independence in work, relationships with colleagues, relationship with immediate supervisor, ambiguities about work, information, communications, participation, contact possibilities, uncertainty about the future, remuneration, and career possibilities (Rothmann, Mostert, & Strydom, 2006). The items were rated on a four-point scale ranging from 1 (never) to 4 (always). Support for seven dimensions has been found in past research, all with acceptable reliabilities ($\alpha > 0.70$). For job demands the factors are overload and job insecurity, and for job resources the factors include organizational support, growth opportunities, relationship with colleagues, control, and rewards. The JDRS was

created using the appropriate procedures for sound scale development (DeVellis, 2016). This scale was chosen due to the comprehensive nature of the items and the breadth of dimensions covered. Many studies assessing job demands and resources piece together their own measures to assess the different areas of interest. It is the only non-proprietary comprehensive measure tapping into both job demands and job resources.

Data Screening

Data collected through MTurk has been shown to be psychometrically equivalent or superior to other data collection methods such as undergraduate samples and provides adequate quality data for psychological research (Buhrmester, Kwang, & Gosling, 2011). However, as with any data collection method, there are limitations to the use of MTurk. It is possible to minimize the factors that negatively affect the quality of data though (Buhrmester, Talaifar, & Gosling, 2018). Multiple preventative measures were taken to reduce inattentive responding. First, only participants with an approval rating of 97% or higher were allowed to respond to the survey. This rating is given by requesters (those who are gathering data), who can reject the worker's responses if they are careless. Second, I utilized attention check questions to ensure that participants gave the survey their full attention and answered in a dependable manner. DeSimone, Harms, and DeSimone's (2014) items were utilized, which were randomly scattered throughout the survey and deliberately ask participants to select certain answers to ensure that they are reading all the items (see appendix A).

Steps were also taken to screen out artificial intelligence systems ("bots"). Although policy forbids workers from using auto-completing bots, some still do (McCreadie, Macdonald, & Ounis, 2010). Three questions screened for bots. First, a standard reCAPTCHA was incorporated directly into the Qualtrics survey. Second, the question "what is 33 minus 3?" was

put into a jpeg file using an unfamiliar font and was embedded into the survey, as only a human could answer that question since a computer can't read words in an image easily. Last, an open-ended response was required to the question "Please type the fourth word of this sentence in the box". Bots can't respond appropriately on questions such as these and answers given are usually nonsense, thus providing another way to ensure quality responses.

Any participant who answered two or more of any of these items incorrectly were excluded from the analysis. In total, twelve participant's data were rejected due to their inability to meet this criteria, with a majority incorrectly responding to three or more of the attention check items. Last, one question was utilized to address a major concern with non-English speakers taking the survey regardless of their ability to comprehend the content (Feitosa, Joseph, & Newman, 2014). This study explicitly required all participants to speak English, as described in the title of the task. To ensure adherence to this criteria, I included a revised TOELF reading comprehension question to be answered correctly to proceed on to the survey. The revision made the correct answer more obvious. This method alone screened out an additional 1,760 participants, all of which were likely bots and non-English speakers. MTurk workers have the option to contact the researcher, and of the 1,760, only six individuals contacted me regarding their adequate ability to speak English but their failure at completing this English-speaking requirement. Thus, this screening method appeared to exclude a vast majority of the intended individuals and artificial intelligence from contaminating the quality of the data.

Chapter 3 - Results

Analysis

Factor Structure

After data collection, AMOS statistical software was utilized to conduct Confirmatory Factor Analyses (CFA) to check the hypothesized four-factor structure of PsyCap and the seven-factor structure of the JDRS. The reliabilities of the scales were assessed as well. Descriptive statistics and correlations between the variables are in Table 1.

In the first CFA, each of PsyCap's four dimensions were entered as latent variables, with each dimension's six items added as the indicators. All variables were allowed to covary. The chi-square statistic was significant ($\chi2 = 1421$, $df = 246$, $p < .001$), which was expected due to the large sample size. The remaining fit statistics also indicated mediocre fit ($\chi2/df = 5.87$; CFI = .88; TLI = 0.87; RMSEA = .07, 90% confidence interval from .067 to .074). To attempt to improve the fit to more acceptable levels, another CFA was conducted on the same PsyCap scale, this time adding an additional latent factor with paths drawn to reverse coded items only. This factor was not allowed to covary. The results of this CFA indicated poor fit for the PCQ-24 PsyCap scale regarding the chi-square statistic ($\chi2 = 1579$, $df = 244$, $p < .001$), which was expected to be significant due to the large sample size. All other fit indices showed worse fit than the four-factor model ($\chi2/df = 6.47$; CFI = .87; TLI = 0.84; RMSEA = .075, 90% confidence interval from .071 to .078). Further, a CFA was conducted to examine if a one factor solution provided improvements in model fit. The results of this CFA indicated poor fit for the PCQ-24 PsyCap scale regarding the chi-square statistic ($\chi2 = 2880$, $df = 252$, $p < .001$), which was again expected to be significant due to the large sample size. All other fit indices showed worse fit than the four-factor model and five-factor model ($\chi2/df = 11.43$; CFI = .74; TLI = 0.71; RMSEA =

.103, 90% confidence interval from .100 to .107). Thus, the four-factor model was deemed most appropriate, regardless of the mediocre fit. The reliability of the whole scale was adequate (α = .92), and the same was true for the subscale reliabilities. Measures for core self-evaluations and job satisfaction were also included in the Qualtrics survey to ensure the PCQ-24 was working as it should be, and the strong and moderate positive correlations between the variables provided evidence of this. See Table 1 for specific Chronbach's alpha values and intercorrelations. The same procedure was then used to check the factor structure of the JDRS's seven dimensions. The chi-square statistic was significant ($\chi 2$ = 6645, df = 798, $p < .001$), which was expected due to the large sample size. The remaining fit statistics also indicated poor fit ($\chi 2/df$ = 8.33; CFI = .73; TLI = 0.73; RMSEA = .085, 90% confidence interval from .085 to .089). The reliability of the JDRS was adequate (α = .91) and each of the dimensions had acceptable reliability as well (α = .71 - .93). See Table 1 for exact Cronbach's alpha values. This poor fit could be due to the somewhat illogical groupings of items in each dimension, however, a complete rework of the scale is beyond the scope of this study. Thus, the scale was utilized as it was previously validated.

Assumptions.

Latent profile analysis is held to assumptions that are more relaxed than those utilized in cluster analyses (Morin et al., 2011), as local independence is too restrictive. Upholding multivariate normality is emphasized though. Using RStudio (RStudio Team (2016), Mardia's test of multivariate normality was utilized to test for this assumption on the PsyCap data. All four variables were tested in tandem first, and then each pair of variables was examined as well. All tests were failed, and the assumption of multivariate normality was violated. See Table 2 for specific p-values.

Next, three transformations of increasing corrective power were applied and compared to attempt to uphold the assumption. A reflected square root transformation, a reflected logarithmic (log) transformation, and a reflected inverse transformation were applied. Then each transformed data set was tested with Mardia's test, including a test for each pair of the four variables within each data set. As seen in Table 2, no transformation allowed for Mardia's test of normality to be upheld when all four variables were tested simultaneously. However, when examining the pairs of variables, one transformation does result in improvements. Almost all of the kurtosis tests for the pairs of variables in the reflected logarithmic transformation data set did pass, and one pair consisting of hope and resilience did pass Mardia's test of multivariate normality. Given this improvement, the reflected log transformed data set was utilized throughout the rest of the analysis. However, since Mardia's test was still failed when all four variables were examined together, the original data set was also run through the remaining analyses to provide an opportunity to compare results. From this point forward, the reflected log transformed data set will be referred to generally as the "transformed data" and the original untransformed data will be referred to as the "original data".

Latent Profile Analysis

A common standard for the best fit criteria in LPA is lacking (Tein, Cox, & Cham, 2014), thus, determining the presence of profiles and the legitimacy of those profiles is a process involving both an examination of fit metrics and a visual analysis. The Bayesian Information Criterion (BIC), with higher values indicating better evidence of the most appropriate model, was given the most weight, although other factors such as profile size and interclass distance must be considered as well.

RStudio was utilized to analyze the data. Composite variables for hope, self-efficacy, optimism, and resilience were assessed using the Mclust package. Models from two to seven latent profiles were initially specified (Model 2 specifies 2 profile, Model 3 specifies 3 profiles, and so on), with additional models being specified if necessary. The Mclust package was also used to test all possible model options without specifying a certain number of profiles, which then determines the best model based on the highest BIC while also emphasizing high intra-class similarity, model complexity, and high interclass distance. Chi-Square statistical values were not used in determining the best model due to the tendency for Chi-square tests to be significant with a large sample size.

Original data. The results of the LPA (Table 3) show the BIC values slowly increasing from Model 2 to 4, and then decreasing slightly from Model 4 to 5, and increasing from 5 to 6. After Model 6 there is a large improvement to Model 7. At this point, models specifying 8 and 9 profiles were run to allow for a more thorough examination of the BIC values. A small improvement was found from Model 7 to 8, and a worsening fit was found from Model 8 to 9. This evidence indicates that Model 9 is not as good as Model 8, and Model 8, with the highest BIC of all the models, is best. When Mclust was run without specifying any number of profiles, this 8-profile solution was reported as best. However, further analysis was necessary to determine the legitimacy of this result. Evaluating profile size is useful in determining the number of profiles to retain, as profiles containing less than 5% of the sample are considered spurious and an indication that too many profiles are being considered (Hipp & Bauer, 2006). As seen in Table 3, Model 8 has 3 profiles that have less than 6% of the sample in them. While it is possible that one of those profiles might be meaningful, it is very unlikely that all three are. Thus, it was determined that Model 8 specifies too many profiles. Model 7 was then considered,

which still has 2 profiles consisting of less than 6% of the sample (Table 3). Thus, Model 7 was determined to be inadequate as well. The BIC values for Models 4 through 6 are all quite close in proximity, and with such slight differences in these, at this point it was determined that a visual analysis would provide the best means of determining the correct number of profiles. Thus, Models 4, 5, and 6 for the original data set were analyzed further.

To gain further evidence of which model is best, a visual inspection for meaningful profiles was conducted. Uncertainty plots were created for Model 4, Model 5, and Model 6. These plots show the separate profiles represented by different colors, which allows for comparisons to be made to determine how distinct the profile groupings are. The ellipses show the boundaries of the profiles, and the centroids are depicted as the black dots in the center of the ellipses. As seen in Figure 1, when comparing Model 4 to 5, the addition of the fifth profile resulted in fewer centroids being encompassed by other profiles, and the red grouping in Model 4 split into distinct groups in Model 5. However, when comparing Model 5 to 6, it becomes apparent that the addition of a profile in Model 6 resulted in two almost completely overlapped profiles. This indicates that a 5-profile model best captures the unique differences between groupings of variables based on different levels of the PsyCap variables. The red grouping appears to be a qualitative difference among the PsyCap variables as well, which could be a truly meaningful profile. For example, a main difference between the orange and red groupings in Figure 1 for Model 5 appears to be the level of optimism (x-axis), such that the orange group scored higher on the optimism dimension than the red group, but the two were almost at equal levels of self-efficacy (y-axis). The other combinations of PsyCap variable plots were analyzed in this same manner and provided further support of a 5-profile model. However, as seen in Table 3, Model 5 has one subgroup with only 6% of the sample, which could be a cause for

concern. Upon further inspection, it was determined that this was a small albeit meaningful group that existed in Models 3 and 4 as well. Thus, Model 5 with five profiles best fit the original data.

Transformed data. Due to the violation of the assumption of multivariate normality, it is important to test the legitimacy of the untransformed results by comparing them to the transformed data. At the beginning of the analysis, it was determined that the reflected logarithmic (base 10) transformation corrected the negative skew most appropriately, although Mardia's test of multivariate normality still wasn't fully upheld. Thus, the same exact procedure conducted with the original data set was then used to analyze the transformed data. The results of the analysis can be seen in Table 4. The BIC values increase slightly from Model 2 to 3, then a large improvement is seen from Model 3 to 4. This trend then reverses, with a decrease in the BIC from Model 4 to 5 and from Models 5 through 7. This evidence indicates that Model 4 with four profiles is best, and indeed, when Mclust was run again without specifying a number of profiles, a model with 4 profiles was returned as the best fit. This model does have one profile that is only barely more than 5% of the sample, which can be an indication of a spurious profile. However, further examination revealed that this appears to be a legitimate grouping of individuals who scored similarly on the PsyCap measure across all dimensions. Thus, no reduction in the number of profiles was necessary and Model 4 is still best. Since there is a large difference in the BIC values of Models 3 and 5, with Model 4 being substantially higher, no additional visual comparisons of separate models would be necessary. However, since the original data fit a 5-profile model best, a visual analysis of these two models from the separate data sets was conducted to find the cause of the discrepancy.

As stated previously, the reason for picking Model 5 for the original data set really centered around the potentially meaningful profile that emerged, as seen in Figure 2 on the right. If a similar profile emerged in the reflected log transformed data set, then this would be a good indication that the BIC method of model selection was missing this valuable profile. However, if no such profile emerged, it is much more of an indication of a spurious profile that is most likely resulting from a violation in multivariate normality. Uncertainty plots were created for Model 4 and Model 5 from the transformed data (Figure 3) and these were then compared. Based on Figure 3, it is apparent that the addition of a fifth profile (right) results in a very distinct overlapping and not in any sort of a meaningful result. This indicates that the reflected log transformation is correcting the data adequately, while the original data is causing spurious results. Thus, Model 4, with four profiles, from the transformed data set was determined to be the best model.

Determining Profile Meaning

Now that the best model has been selected, the next phase in an LPA consists of determining the characteristics of each profile and prescribing meaning. The existence of profiles was determined both visually and by using statistical criteria, however, extracting meaning from the profiles is an inherently subjective process. Theory and analyses should be utilized, but it is the researcher's responsibility to determine if the profiles have useful interpretations for theory and practice that are meaningful. The extracted profiles would be most valuable when the subgroups differ both qualitatively and quantitatively (Marsh et al., 2009). For example, quantitative differences only would represent four groups with only high, only medium, only moderate, and only low levels across the four PsyCap dimensions. Qualitative differences would have variation in which dimensions had higher values, and which had moderate or lower values.

For example, group A might be high on resilience, low on self, efficacy, and moderate on optimism and hope, while group B is high on self-efficacy and hope, and low on optimism and resilience, and group c has a different profile from A and B as well. Unfortunately, only quantitative differences exist between the profiles found in this analysis, thus, the utility of LPA is minimized, and the research question this study sought to answer is inconclusive. However, valuable insight can still be gained through a better understanding of who belongs to these quantitatively different profiles.

Mean differences. To begin prescribing meaning, I first plotted the mean values of the PsyCap dimensions for each of the four profiles to examine the differences. Figure 4 shows the PsyCap dimension level means making up each profile. Ceiling effects were present in the PsyCap scale, and this lack of endorsement of the lower values of the PsyCap scale shows up in the profiles too. Very few respondents utilized the whole range of response options. Although the differences in Figure 4 are only spanning the upper half of the PsyCap level range, all of these profile dimension means were significantly different from one another (see Table 5). ANOVAs and Tukey post hoc comparisons tests were conducted to examine these mean differences, and all were significant at $p < .001$.

Next, each profile was examined to see the characteristics of who belonged to that group. The data gathered on the employee's job demands and resources serves as a framework to meaningfully interpret each profile. An LPA assigns each participant a score representing the probability of being assigned to each potential group. This continuous differentiation between participants allows regression analyses to be utilized to assess the predictive ability of each profile's group membership. Each participant's probability scores sum to 1.00, with different values depending on how many profiles are found, meaning that all profiles cannot be combined

to predict outcomes due to a lack of independence across profiles, but a single profile's probability scores can be used as a dependent variable, and thus can be useful for predicting outcomes (Isler, et al., 2016). Using this procedure, age and sex were included in the analysis, and job demands and resources were examined as seven distinct dimensions, as well as in an overall score, which was obtained by subtracting the total job demands composite from the total job resources composite (resources minus demands). Table 6 shows an in-depth look at what these dimensions consist of. Job satisfaction and core self-evaluations were also included. These variables were entered into the regression analysis predicting each of the four profile's group membership probabilities.

As mentioned previously, this scale had poor model fit when the 7-factor structure was assessed. However, no changes were made due to these scale revisions being beyond the scope of the study.

Profile 1 Characteristics. Profile 1 (n = 546) only has quantitative differences rather than varying levels of each of the constructs. It consists of the second highest values on all four dimensions compared to the other profiles. The range of these mean scores falls within 4.3 points. Within this profile, self-efficacy mean scores are highest (M = 26.9), and optimism (M = 22.6) scores are lowest, with resilience (M = 25.7) and hope (M = 25.6) falling closely in the middle. Although the majority of responses fell between 20 and 30 points on the PsyCap dimension scale, other responses did occur on the lower end of the spectrum. Violin plots are a useful tool to show this type of a characteristic of the data. These (mostly violin-shaped) plots are a mix between a box plot and a density trace plot, and they show a visual depiction of the distribution of the data. Based on the long skinny tails in the violin plots in Figure 5, you can see how the thicker part of the trace is where the majority of the responses are, while the long skinny

tail shows the respondents who, unlike the vast majority, did endorse lower values on the PsyCap scale. The results of the regression analysis revealed that six variables accounted for 11% of the variation in probability of profile membership ($R2 = .110$, $F(12, 960) = 9.86$, $p < .001$). Specifically, employees who were older ($\beta = .062$, $p = .045$), employees with higher workloads ($\beta = .078$, $p = .018$), and employees who felt they had higher levels of job security ($\beta = -.064$, $p = .046$) and had more supervisor support ($\beta = .359$, $p < .001$), were more likely to be grouped into this profile. Further, individuals who were dissatisfied with the clarity of and their involvement with decision making and promotion processes ($\beta = -.116$, $p = .017$), and who felt dissatisfied with their pay ($\beta = .101$, $p = .011$) were less likely to be categorized into this profile. The other variables in the regression, including two job resources, the JDR Total, core self-evaluations, job satisfaction, and sex, held no predictive power to predict group membership for this profile (Table 7).

Profile 2 Characteristics. Profile 2 ($n = 175$) consists of the lowest values for each of the PsyCap dimensions compared to the other profiles, although even these are above the midpoint. It is characterized by higher levels of resilience ($M = 20.5$) and almost equal levels of hope ($M = 19.2$) and self-efficacy ($M = 19.0$), and slightly lower amounts of optimism ($M = 17.1$). The violin plot tails in Figure 5 reach the farthest for this profile, and you can see that responses greater than 25 or 27 on the dimension scores were nonexistent. The results of the second regression analysis revealed that four variables accounted for 21% of the variation in probability of profile membership ($R2 = .206$, $F(12, 960) = 20.714$, $p < .001$). Group membership in profile 2 was more likely for younger employees than for older employees ($\beta = -.083$, $p = .005$), and it was more likely for employees who feel they are needing more job security than they are currently feeling ($\beta = .124$, $p < .001$). Further, employees who were being

supported at adequate levels by their supervisors (β = -.302, p < .001), and those employees who had higher levels of autonomy and variety in their work (β = -.090, p = .042) were less likely to be in this profile. No other variables were significant predictors of the probability of Profile 2 group membership (Table 8).

Profile 3 characteristics. Profile 3 (n = 201) consists of almost equally moderate values of all four dimensions of PsyCap, with these means only spanning a range of 2.8 points. It has the second lowest values compared to all other profiles, with only profile 2 being lower. The violin plots in Figure 5 indicate a bit of a ceiling around 27 points on the PsyCap scale, with all responses falling within 10 points underneath that score for self-efficacy and hope, and only very small tails trailing lower than that for resilience and optimism. The results of the regression analysis revealed that two variables accounted for 4% of the variation in probability of profile membership (R2 = .043, F(12, 960) = 3.580 p < .001). Group membership was more likely for individuals with inadequate supervisor support (β = -.238, p < .001). Further, as people were more satisfied with their pay, the more likely they were to be in this group (β = .082, p = .048). No other variables were significant predictors of probability of Profile 3 group membership (Table 9).

Profile 4 characteristics. Profile 4 (n = 53) is another quantitatively different profile, consisting of nearly equal high values of all four dimensions of PsyCap, with these means only spanning a range of 0.5 points (M = 29.8 – 29.3). The violin plots in Figure 5 show how few responses trail lower than about 27 points on the PsyCap dimension scales, indicating that employees in this profile endorsed the highest values for each of the PsyCap dimensions. The results of the regression analysis revealed that three variables accounted for 11% of the variation in probability of profile membership (R2 = .0114, F(12, 960) = 10.246, p < .001). Group

membership was more likely for older employees (β = .074, p = .017) and employees who were satisfied with the clarity of and their involvement with decision making and promotion processes (β = .140, p = .004), and the security of their jobs (β = -.122, p < .001). No other variables were significant predictors of probability of Profile 4 group membership (Table 10).

Chapter 4 - Discussion

The purpose of this study was to shed light on PsyCap from a person-centered perspective. Through the use of LPA, the data was examined for patterns among the PsyCap variables, in hopes of finding qualitatively different profiles that could be explained by contextual workplace factors. These profiles did not emerge, and instead, four profiles with quantitative differences only were found. Thus, the answer to research question 1, which sought to find distinct profiles consisting of varying levels of the four dimensions through the use of LPA, was that a constellation of these dimensions was not present. Many factors could be influencing this result. The positive appraisals and conation (Luthans et al., 2007) that run throughout the four dimensions of PsyCap could provide an equal force in either direction that affects all the variables. Further, since research has shown support for an integrated method of enhancing PsyCap, it is possible that PsyCap diminishes in a similar way, thus resulting in all four components maintaining a very similar level for each person. Longitudinal studies are recommended for future research to determine if these variables move in tandem over time, and this study design paired with an intervention would allow a better understanding of whether individual enhancement of each construct is even possible. Aggregated PsyCap scores must not be the only scores reported though for insight to be gained. Last, these results align with Hobfoll's (2001) idea of resources being drained simultaneously when facing demands. If resilience relies on hope, self-efficacy, and optimism as assets, it is easy to see the intertwined

relationship in PsyCap. Thus, this study has mainly provided support for the inextricable link between these constructs, which will require much more research to be able to understand.

The predictive power of job demands and resources

Although qualitative profiles of the PsyCap variables did not emerge, the identification of profiles at medium through maximum levels of PsyCap is still a novel finding, thus enhancing PsyCap theory and spurring the need for future research. Further, pursuing a better understanding of how job demands and resources can provide a framework for understanding why employees were in certain profile (research question 2) did result in interesting findings aligning with JD-R theory.

Results of the four regression analyses did show that job demands and resources could be utilized to predict group membership. Although this study did not allow for the test of causality, and did not include employee health and performance variables, these results generally aligned with JD-R theory's position that the presence of more job demands can result in difficulties for employees, which here is conceptualized as lower levels of PsyCap.

In profile 1, six variables accounted for 11% in the variance of profile membership. The majority of employees sampled were in this profile (56%), which was characterized by a balance of job demands and resources. Employees were more likely to be in this profile if they had high workloads, which is a job demand. However, these individuals did have the second highest levels of PsyCap, and they enjoyed the benefits of higher levels of job security and supervisor support. They were also older individuals, although the effect size for age was quite small but still significant. It is possible that the older employees benefitted from to their knowledge and experience, which could act as a job resource that wasn't available to those individuals in profile 2. These resources weren't all that mattered though, as employees who were unhappy with their

pay and their involvement in work decisions were significantly less likely to be in this profile. It appears that this profile consisted of everyone who was relatively satisfied with the way things were at work, but still had a lot of work to do. If future research supports the existence of this profile, it could be a reasonable happy-medium for employers to shoot for.

In profile 2, 20% of the variance in profile membership was able to be explained, and 3 out of 4 valid predictors were job demands. This profile had the lowest levels of PsyCap. Employees who felt like their job wasn't providing them the financial and occupational security they needed, and who weren't receiving adequate supervisor support were more likely to be in this profile. These employees also did not have the autonomy and alignment that they desired. From these results, it appears that the presence of these demands outweighed any benefit of job resources that these individuals might have had, and this may have resulted in their lower levels of PsyCap. It is also possible that since younger individuals were more likely to be in this profile, age provided a disadvantage, where they were lacking some sort of beneficial knowledge and experience, as stated above. Future studies of this kind should also include data on tenure so that this relationship can be more fully explored.

The regression analysis examining Profile 3 did not result in near as much explained variance as the other profiles, only allowing for insight into 4% of the variance. Individuals with this profile did not have adequate supervisor support but were happy with their pay. This group represented the second lowest levels of PsyCap, and the marked difference in job demands present in this profile versus Profile 2 could be an indicator that more job demands could be dragging down employee PsyCap.

Last, the analysis of profile 4 provided a hopeful goal to aim for, as the predictors of this profile were mainly job resources. Again, older employees were more likely to be in this ultra-

high PsyCap profile, as were individuals who were supported by their supervisors and given autonomy over their work. Job autonomy is already a well-supported predictor of work performance (Humphrey, Nahrgang, & Mogeson, 2007), and supervisor support is another variable that, when present, leads to many desirable work outcomes (Rhoades & Eisenberger, 2002; Viswesvaran, Sanchez, & Fisher, 1999), thus this result could provide even more support for these relationships. If these work conditions created an environment that allowed employee PsyCap to reach these heights, then positive organizational benefits could ultimately be gained from aiming for supported, autonomous employees.

In sum, research question 2 did indeed result in fruitful findings. Much insight was gained into JD-R theory's role in affecting the levels of PsyCap in employees, although we as researchers have been left with more questions than answers.

The presence of ceiling effects

The vast majority of the 975 employees surveyed have medium-high levels (profile 1) of PsyCap. If you combine profiles 1 and 4, which together averaged over 100 out of 120 on the PsyCap scale, it equals 61% of the sample having very high levels of PsyCap. If those who scored over 90 are included, then this percentage jumps to 82%. This could be considered good news as it seems that employees aren't suffering from depleted resources, and in general don't need to have their levels of PsyCap enhanced, but it could also be a result of measurement limitations. It is important to recognize that these levels could fundamentally change if the PsyCap scale tapped into the full spectrum of possible PsyCap values, rather than only utilizing the upper third of the scale.

It is possible that this issue stems more from this particular sample, which does have some unique characteristics that are described in the limitations section. However, the PsyCap

scale is having what seems to be a near constant issue with negative skew and ceiling effects. A psychometric review of the PsyCap construct listed 21 published studies utilizing the PCQ-24 or 12. Of these, only 5 had lower PsyCap means than found in this study (M = 3.83) (Dawkins, et al., 2013) and studies not included in the review also had the same issue (e.g. Tüzün, et al., 2014; Görgens-Ekermans & Herbert, 2013). Further, a number of longitudinal studies had problems with ceiling effects during the PsyCap pretest, which then limited their ability to determine the full potential of a PsyCap intervention (e.g. Williams, et al., 2015; Hodges, 2010). Given the practical focus of PsyCap, where the whole idea is that these resources can be enhanced in employees to achieve important employee performance and health outcomes, it seems disadvantageous to have a scale that is incapable of differentiating between levels of PsyCap above the mean. Social desirability bias must begin to be taken into account to better understand how severely this affects an employee's responses to the PsyCap scale. Real value could come from effort to reduce this ever-present ceiling effect.

A closer examination of and further research with the PsyCap scale could result in a measure able to truly discern who does and does not have these resources along the whole spectrum of response options. The lack of a measure that is capable of this directly impacts the ability to find profiles too. Analyses that utilize Item Response Theory in tandem with Classical Test Theory can result in a measure that has good model fit, but also taps into the whole range of the construct. IRT allows for item discrimination to be examined, which shows how much items are able to discern between someone with truly high levels of PsyCap, or just moderately high levels. Similarly, if items aren't capable of discriminating at low levels of a PsyCap dimension, it becomes impossible to ascertain differences in these variables in employees. Thus, an improved

PsyCap measure could result in more distinctive and well-defined employee profiles, but unfortunately this shortcoming has limited the knowledge to be gained from this study.

Limitations and Future Research Directions

Although great preventative care was taken when developing this study, it is not without limitations. The first four weakness regards the sample. It was gathered through an online recruiting platform, in which respondents self-select for their own tasks, meaning this sample was not randomly selected. Second, the type of respondents is less random and instead is restricted to individuals who take part in research in their free time through Amazon's MTurk. This could cause issues, for example, if only individuals who are relatively high in PsyCap or in job resources have the time and energy to partake in an online survey for a bit of extra money. This potential exclusion of individuals who don't opt in for reasons we are unable to control for is important to keep in mind when dealing with samples such as these.

A third limitation is the lack of knowledge regarding where the individuals in this study worked. It is unknown whether any were employed by the same organization or corporation. This insight is important, as profiles might be more likely to surface when context is held more constant. For example, since a single organization's workforce of 1000 individuals is exposed to more similar working conditions, job resources, and job demands, than 1000 individuals from 100+ separate organizations, context would be more controlled and similar in the sample from a single organization than from 100+ different organizations. This would allow the frame of reference for the JDRS scale and the PsyCap scale to be more specific and less subjective. Thus, future research should examine the existence of PsyCap profiles in individual organizations or specific units.

Fourth, this sample was also very highly educated. The Bureau of Labor Statistics shows that only 22.3% of jobs typically require a bachelor's, master's, or professional degree (18.0%, 1.7%, and 2.6%, respectively; Torpey & Watson, 2014), and that 41% of employed individuals in the United States have a bachelor's degree or higher (Lacey, et. al., 2017). Compared to the 68% of employees in the current sample who held a bachelor's degree or higher, this discrepancy makes it necessary to use caution when generalizing these findings to other situations and circumstances.

A few limitations concern methodological issues. First, the study could have benefitted from the inclusion of additional measures aside from self-report data, thus reducing monomethod bias. Last, other performance and personal variables of interest, such as measures of job performance, employee wellbeing, and positive and negative affect would have been beneficial to examine as a part of this study. Future research should include these variables in studies to provide for more opportunities to better understand the relationships between these variables, and the boundary conditions that surround each of the four constructs.

The last set of limitations concerns the psychometric properties of the scales utilized in the study. First, the assumption of multivariate normality was violated. Results should be interpreted with caution. Reasons for this non-normality are hard to know objectively, but the ceiling effects mentioned previously contribute directly to the problem. As mentioned above, the ceiling effects present in the PsyCap data are not unique to this sample. This indicates that the restricted range of potential responses is a scale issue. Future research should examine solutions for correcting for range restriction in the short term, and in the long term, a more fine-tuned PsyCap scale should be developed. Analyzing the PsyCap scale with an IRT analysis will allow for a better understanding of what level of PsyCap the PCQ-24 is actually capable of tapping

into. Second, the factor structure of the Job Demands-Resources Scale was inadequate, which is problematic since the dimensions were utilized to predict group membership. Future research should examine the consistency of the proposed dimensions to determine if the scale should be improved upon. Third, the PCQ-24 had mediocre model fit when the factor structure was tested. Thus, the PsyCap scale could benefit from psychometric improvements, and the results of this study may have been different if the factor structure of the PsyCap scale was supported more strongly due to the dimension-focused nature of the latent profile analysis.

Finally, future research could benefit immensely from longitudinal studies that allow for the levels of each individual component of PsyCap to be examined, rather than a composite score. This will allow for better insight in the fluctuation of PsyCap dimensions over time. Further, more research needs to be conducted to examine job demands and resources effects on PsyCap. This insight could provide researchers and practitioners with a much more holistic view of how employee PsyCap is influenced by different workplace variables over time.

Conclusions

Regardless of the limitations in this study, the results provide valuable insight into the inner workings of the psychological capital variables. Varying levels of these profiles were found, but the profiles were only qualitatively different from one another. Constellations of the four PsyCap dimensions did not emerge. The ceiling effects point towards a lack of the ability for the PsyCap scale to discriminate at higher levels. This could be the driving force behind these results, or it is also possible that these dimensions are intertwined in such a way that they rise and fall as one. Job demands and resources, as well as employee age, provided a means to predict which employees would be in each profile. Improvements in the dimension factor structure could result in stronger results here as well. Overall, this knowledge is a strong first step in

understanding what profiles might be emerging in organization, and why. More insight has been gained about the interplay of the PsyCap dimensions, and important directions for future research have been discovered.

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Appendix A - Attention Check Filters (Inserted throughout survey)

1. This is an attention filter, please select Disagree for this statement.
2. Select Agree for this statement, this is an attention filter.
3. Please choose Strongly Disagree for this statement, this is an attention filter.

Appendix B - PCQ24 Sample Items

1. I feel confident analyzing a long-term problem to find a solution. (self-efficacy)
2. I feel confident in representing my work area in meetings with management. (self-efficacy)
3. If I should find myself in a jam at work, I could think of many ways to get out of it. (hope)
4. I always look on the bright side of things regarding my job. (hope)
5. I feel I can handle many things at a time at this job. (resilience)
6. I usually take stressful things at work in stride. (resilience)
7. I always look on the bright side of things regarding my job. (optimism)
8. I'm optimistic about what will happen to me in the future as it pertains to work. (optimism)

Appendix C - Figures

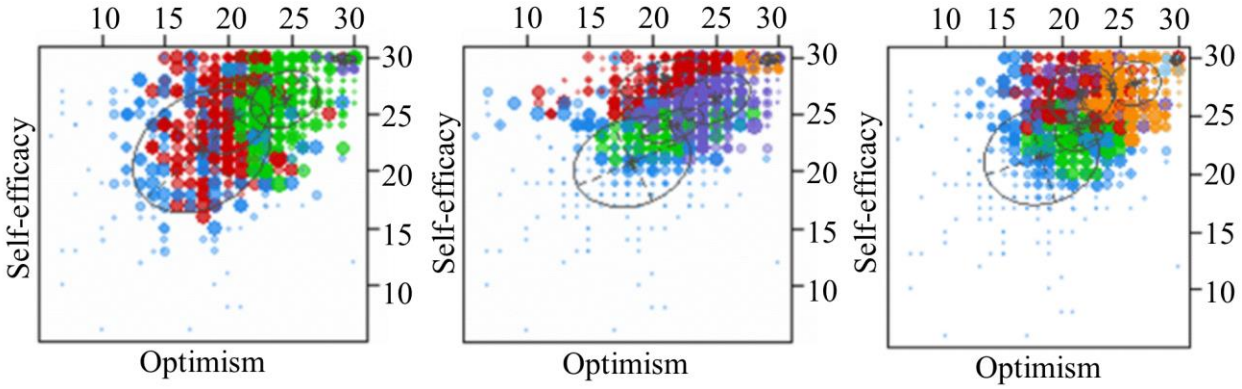

Figure 1. Uncertainty plots from the original data depicting self-efficacy (y-axis) and optimism (x-axis) for Model 4 (left), Model 5 (center), and Model 6 (right). Note the overlapping profile in Model 6.

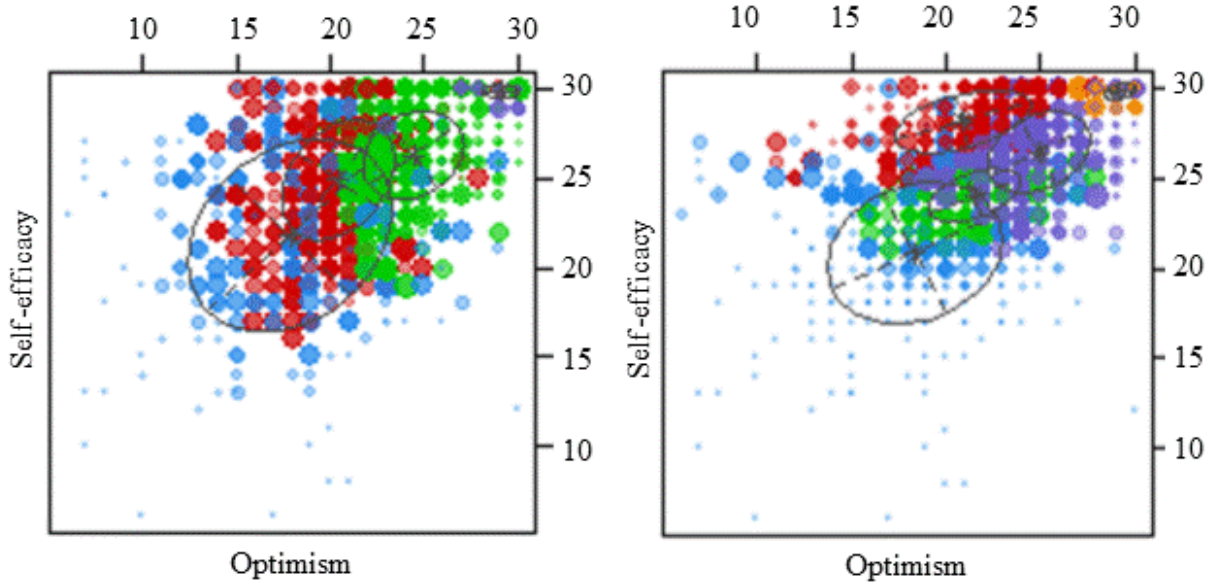

Figure 2. Original data set, Model 4 (left) and Model 5 (right) with the meaningful profile emerging in red.

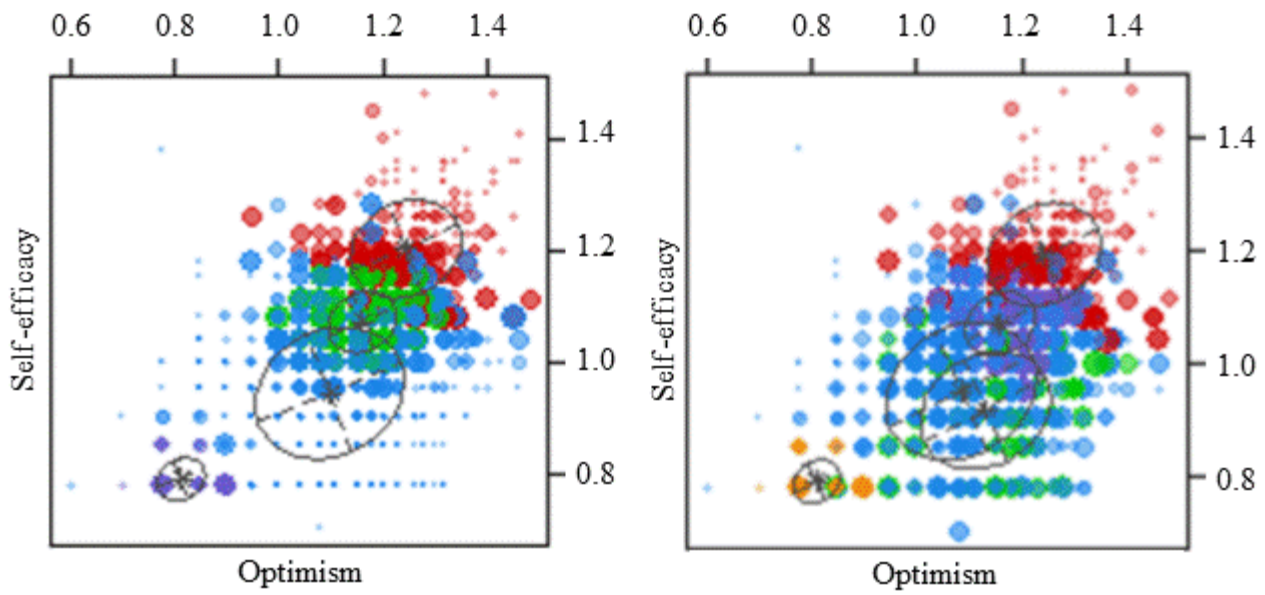

Figure 3. Uncertainty plots for transformed data. Model 4 (left) and Model 5 (right). No meaningful profile emerges in Model 5, and the substantial overlap between two of the profiles (green and blue) indicates that too many profiles are being specified.

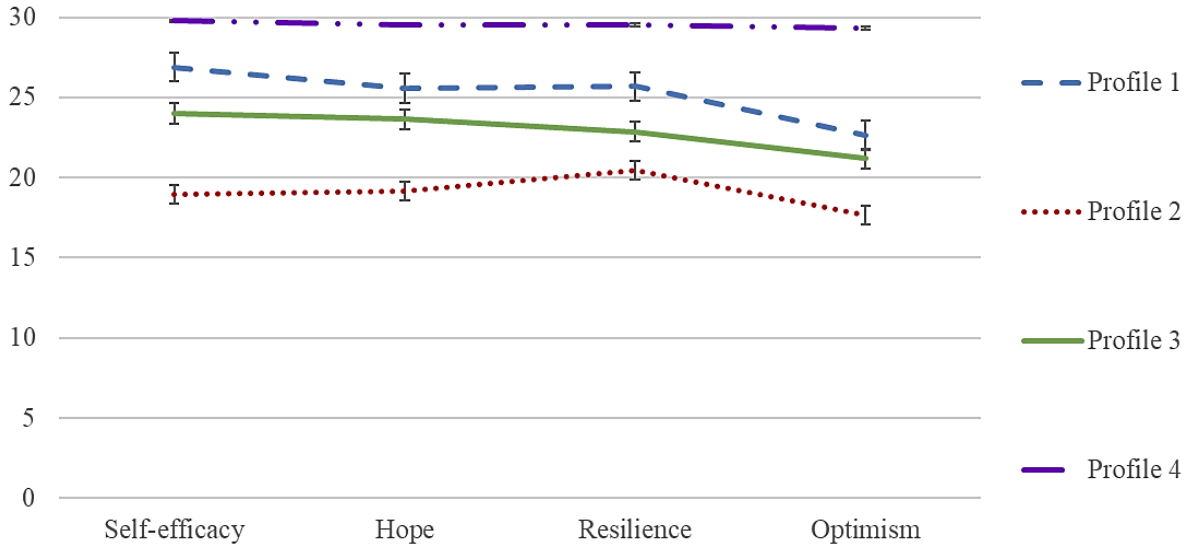

Figure 4. Mean values of each PsyCap dimension for the four profiles.

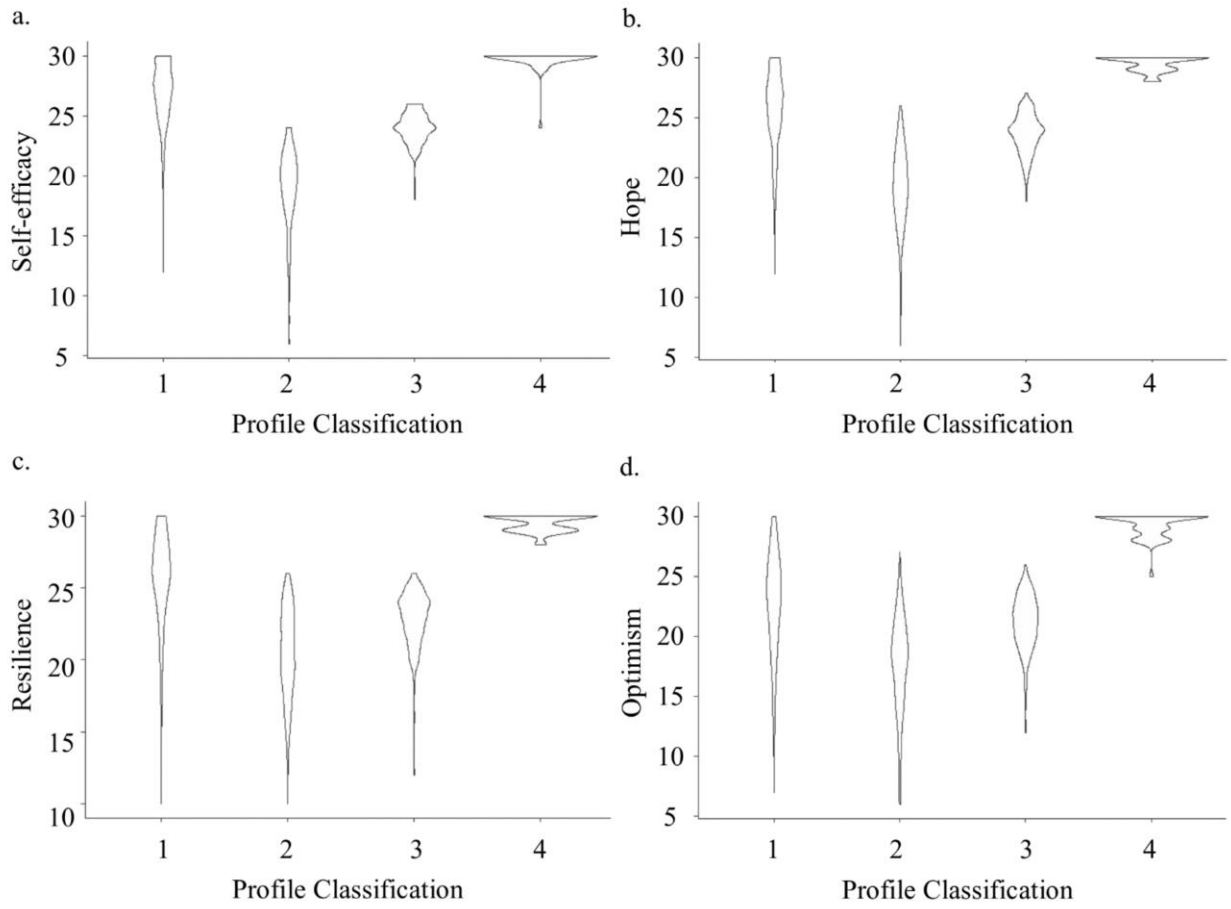

Figure 5. Violin plots for self-efficacy (a), hope (b), resilience (c), and optimism (d) for each of the four profiles. Note the y axis start values. These plots show a visual of the distribution of the data, with wider parts depicting more responses.

Appendix D - Tables

Table 1. Means, standard deviations, and intercorrelations between all study variables. Cronbach's alpha values are listed on the diagonal.

			Variables							
Variables	*M*	SD	1	2	3	4	5	6	7	8
1. Overall PsyCap	3.98	.56	(.92)							
2. Self-efficacy	25.03	4.01	.81	(.84)						
3. Hope	24.25	4.00	.87	.68	(.84)					
4. Resilience	24.37	3.70	.80	.56	.59	(.73)				
5. Optimism	21.81	4.61	.82	.47	.62	.55	(.76)			
6. JD - Workload demand	3.09	.74	**-.08**	.04	.00	-.08	-.20	(.79)		
7. JR – Skill, autonomy, value	3.42	.82	.46	.32	.45	.27	.45	.12	(.82)	
8. JR - Supervisor support/ expectations	3.79	.72	.58	.42	.52	.44	.53	**-.07**	.66	(.91)
9. JR – Colleague support	3.82	.86	.43	.27	.37	.36	.43	-.09	.46	.59
10. JR – Inclusion in decisions	3.17	.85	.40	.32	.43	.14	.42	.01	.67	.67
Table 1 (continued)										
11. JD - Security demands	2.58	1.25	-.28	-.15	-.18	-.31	-.27	.24	-.06	-.16
12. JR – Pay satisfaction	3.06	1.05	.26	.14	.29	.08	.34	-.10	.53	.45
13. JDRS Total	8.42	3.28	-.03	.01	-.05	-.01	-.04	.02	-.06	-.05
14. Core self-evaluations	3.62	.77	-.07	.00	-.07	-.06	-.10	.02	-.06	-.05
15. Job Satisfaction	3.07	.82	-.03	-.02	-.05	.00	-.03	.00	-.04	-.01
16. Age	36.41	9.39	.18	.13	.11	.20	.17	-.07	.01	.09
17. Sex	1.48	.50	.00	-.02	-.01	.05	-.01	.09	-.03	.00
18. Education	4.69	1.23	-.04	.04	.00	-.13	-.05	.07	.08	-.01

	Variables									
Variables	9	10	11	12	13	14	15	16	17	18
9. JR – Colleague support	(.80)									
10. JR – Inclusion in decisions	.36	(.72)								
11. JD - Security demands	-.14	-.02	(.93)							
12. JR – Pay satisfaction	.36	.58	.00	(.87)						
13. JDRS Total	.01	-.03	-.01	.00	(.91)					
14. Core self-evaluations	-.01	-.03	.04	.00	.59	(.90)				
15. Job Satisfaction	.01	-.03	.02	.02	.62	.54	(.91)			
16. Age	.09	-.03	-.09	.01	-.05	**-.08**	-.02	(n/a)		
17. Sex	.02	-.11	-.04	-.13	-.02	-.03	.00	**.08**	(n/a)	
18. Education	-.01	.03	**.07**	.09	-.03	-.05	**-.07**	-.03	-.02	(n/a)

Note. Coefficient alpha reliabilities are reported on the diagonal. All correlations are significant at the $p < .01$ level. $n = 975$ for all variables except for sex ($n = 973$) and education ($n = 974$). Bolded values indicate significance at $p < .05$ or less. "JD" = Job demand, "JR" = job resource, "JDRS" = Job Demands-Resources Scale, "JDRS Total" = job resources minus job demands.

Table 2. Results of Mardia's test of multivariate normality, including specific tests for skewness and kurtosis. All four PsyCap variables were tested, as well as pairs of each variables for each of the three transformed data sets, and the one original untransformed data set. All p-values for the original data were < .001.

Dataset	Reflected Sqr. Root			Reflected Log			Reflected Inverse		
	Mardia's Test			Mardia's Test			Mardia's Test		
Variables	MVN	Skew	Kurt	MVN	Skew	Kurt	MVN	Skew	Kurt
All dimensions	Fail	<.001	.000	Fail	<.001	<.001	Fail	<.001	.000
S-efficacy and Hope	Fail	<.001	<.001	Fail	.023	**.484**	Fail	<.001	<.001
S-efficacy and Resilience	Fail	<.001	<.001	Fail	<.001	**.838**	Fail	<.001	<.001
S-efficacy and Optimism	Fail	<.001	.022	Fail	<.001	**.368**	Fail	<.001	<.001
Hope and Resilience	Fail	<.001	.019	**Pass**	**.100**	**.690**	Fail	<.001	.000
Hope and Optimism	Fail	<.001	.036	Fail	<.001	**.453**	Fail	<.001	.000
Resilience and Optimism	Fail	<.001	**.089**	Fail	<.001	**.159**	Fail	<.001	.000

Note. Failing Mardia's Test indicates that the p-value was less than .05. Nonsignificance means that the data is multivariate normal. Bolded values show nonsignificance. All values less than .001 are denoted with '< .001'. "S-efficacy" = Self-efficacy, "Sqrt" = Square, "MVN" = the status returned by the MVN RStudio package, "Skew" = the significance of the skewness test, "Kurt" = the significance of the kurtosis test.

Table 3. Results of the LPA for the original data set. Largest BIC indicates best model.

Model	BIC	ICL	Log-likelihood	*n*	*df*	Smallest Profile %	Profiles < 6%
Model 2	-20134.31	-20474.65	-9967.36	975	29	49.3	0
Model 3	-19973.25	-20295.23	-9897.153	975	26	5.4	1
Model 4	-19965.23	-20498.8	-9810.556	975	50	5.4	1
Model 5	-19967.44	-20456.51	-9811.661	975	50	6.0	0
Model 6	-19962.42	-20618.09	-9829.798	975	44	3.6	1
Model 7	-19921.04	-20369.79	-9788.458	975	50	2.1	2
Model 8	**-19917.95**	-20395.97	-9766.27	975	56	1.7	3
Model 9	-19922.88	-20409.57	-9748.085			2.6	4

Note. the BIC was reported negative in the Mclust package, but the largest value is still the best, for example, -10000 would be preferred over -20000.

Table 4. Results of the LPA for the transformed data set. Largest BIC values indicate the best model.

	BIC	ICL	Log-likelihood	*n*	*df*	Smallest Profile %	Profiles < 6%
Model 2	5661.973	5324.473	2899.811	975	20	28.5	0
Model 3	5663.883	5140.408	2955.825	975	36	21.8	0
Model 4	**5794.711**	5429.245	3007.474	975	32	5.4	1
Model 5	5763.542	5181.98	3012.537	975	38	5.3	1
Model 6	5745.808	5038.003	3024.318	975	44	5.5	1
Model 7	5735.501	5055.287	3039.811	975	50	4.1	2

Note. The BIC was reported positive in the Mclust package, but the largest value is still the best, for example, 20000 would be preferred over 10000.

Table 5. ANOVA results testing mean differences between the classification of each participant into each profile for each of the four PsyCap dimensions. Four ANOVAs were conducted, and Tukey post-hoc comparisons were made to test each specific pairing of profiles. All mean differences are significant at p < .001.

Dependent Variable		ANOVA Results				
	Predictor	*Sum of*	*df*	*Mean*	*F*	*p value*
Self-Efficacy	Profile Classification	9742	3	3247.30	531	**< .001**
	Residuals	5938	971	6.12		
Hope	Profile Classification	7061	3	2353.77	268	**<.001**
	Residuals	8526	971	8.78		
Resilience	Profile Classification	5478	3	1825.94	225	**<.001**
	Residuals	7878	971	8.11		
Optimism	Profile Classification	6441	3	2146.9	147	**<.001**
	Residuals	14228	971	14.7		

Profile Comparison			Tukey's Post Hoc Comparison Results				
		Dimension	Mean difference	*SE*	*df*	*t*	*ptukey*
1 -	2	Self-efficacy	7.93	0.215	971	36.91	**< .001**
		Hope	6.43	0.257	971	24.97	**<.001**
		Resilience	5.23	0.247	971	21.14	**<.001**
		Optimism	4.98	0.333	971	14.97	**<.001**
1 -	3	Self-efficacy	2.90	0.204	971	14.19	**< .001**
		Hope	1.96	0.244	971	8.00	**<.001**
		Resilience	2.81	0.235	971	11.96	**<.001**

Table 5 (continued)

		Optimism	1.44	0.316	971	4.57	**<.001**
1 -	4	Self-efficacy	-2.88	0.356	971	-8.09	**< .001**
		Hope	-3.93	0.426	971	-9.23	**<.001**
		Resilience	-3.83	0.410	971	-9.34	**<.001**
		Optimism	-6.67	0.551	971	-12.11	**<.001**
2 -	3	Self-efficacy	-5.03	0.256	971	-19.69	**< .001**
		Hope	-4.47	0.306	971	-14.59	**<.001**
		Resilience	-2.42	0.294	971	-8.21	**<.001**
		Optimism	-3.53	0.396	971	-8.92	**<.001**
2 -	4	Self-efficacy	-10.81	0.388	971	-27.87	**< .001**
		Hope	-10.36	0.465	971	-22.31	**<.001**
		Resilience	-9.06	0.447	971	-20.28	**<.001**
		Optimism	-11.64	0.600	971	-19.40	**<.001**
3 -	4	Self-efficacy	-5.77	0.382	971	-15.12	**< .001**
		Hope	-5.89	0.458	971	-12.88	**<.001**
		Resilience	-6.64	0.440	971	-15.09	**<.001**
		Optimism	-8.11	0.591	971	-13.73	**<.001**

Note. The profile classification variable consists of 4 levels, which correspond to the four profiles derived in the LPA. Bolded values represent significance at the p <.001 level.

Table 6. Description of the Job Demands and Resources Scale dimensions.

Dimension	Focuses on…	#	Sample items
JD - Workload demand	Quantity of workload, time pressure constraints, attention load, memory load, emotional load, additional difficulty from people and the job.	7	Do you have too much work to do? Do you work under time pressure?
JR – Skill, autonomy, value	Job task variety, attention needed, growth opportunities, autonomy in planning and executing tasks	8	Do you have enough variety in your work? Do you have influence in the planning of your work activities?

Table 6 (continued)

JR - Supervisor support and expectations	Inclusion in decisions about work tasks, supervisor support and appreciation, feelings towards supervisor, job and role clarity, job purpose and alignment.	13	Can you discuss work problems with your direct supervisor? Can you participate in decisions about the nature of your work?
JR – Colleague support	Relationship with colleagues, support from colleagues when help is needed.	3	If necessary, can you ask your colleagues for help? Do you get on well with your colleagues?
JR – Inclusion in decisions	Inclusion in the decision-making process, clarity of the process, influence on the process, and a random question about promotion opportunities.	4	Is the decision-making process of your organization clear to you? Is it clear to you whom you should address the organization for specific problems?
JD - Security demands	Turnover intentions over the next year, job security concerns for the employee's job level and job in general.	3	Do you need to be more secure than you keeping your current job in the next year? Do you need to be more secure than your current job level?
JR – Pay satisfaction	Impressions of pay fairness, quantity of pay, livability of wages, and financial progression opportunities.	4	Do you think that organization pays good salaries? Can you live comfortably on your pay?

Note. Higher values for a job demand mean a worse working environment, and higher values for a job resource means a better working environment. "#" refers to number of items in each dimension. As mentioned previously, this scale had poor model fit when the 7-factor structure was assessed. However, no changes were made due to these scale revisions being beyond the scope of the study.

Table 7. Profile 1 regression results predicting group membership from all dimensions of the JDRS scale, as well as core self-evaluations, job satisfaction, age, and sex.

	Coefficients			
Predictor	β	*SE*	*t*	*p value*
JD - Workload demand	.078	.018	2.380	**.018**
JR – Skill, autonomy, value	-.003	.023	-.072	.943
JR - Supervisor support	.359	.029	7.103	**.000**
JR – Colleague support	.035	.018	.892	.373

Table 7 (continued)

JR – Inclusion in decisions	-.116	.023	-2.381	**.017**
JD - security demands	-.064	.010	-2.001	**.046**
JR – Pay satisfaction	-.101	.015	-2.533	**.011**
JDR Total	-.007	.005	-.154	**.877**
Core self-evaluations	.029	.002	.742	**.458**
Job satisfaction	-.049	.003	-1.215	**.224**
Age	.062	.001	2.003	**.045**
Sex	-.015	.03	-.469	**.640**

Note. Bolded *p* values are significant predictors at the $p < .05$ level. "JD" = Job demands, "JR" = Job Resources, "JDR total" = Job demands minus job resources.

Table 8. Profile 2 regression results predicting group membership from all dimensions of the JDRS scale, as well as core self-evaluations, job satisfaction, age, and sex.

	Coefficients			
Predictor	β	*SE*	*t*	*p value*
JD - Workload demand	-.057	.013	-1.847	.065
JR – Skill, autonomy, value	-.090	.017	-2.033	**.042**
JR - Supervisor support	-.302	.021	-6.332	**.000**
JR – Colleague support	-.063	.013	-1.712	.087
JR – Inclusion in decisions	-.021	.017	-.446	.655
JD - security demands	.124	.008	4.086	**.000**
JR – Pay satisfaction	.043	.011	1.152	.250
JDR Total	-.003	.004	-.073	.941
Core self-evaluations	-.008	.001	-.215	.830
Job satisfaction	.022	.002	.584	.559
Age	-.083	.001	-2.815	**.005**
Sex	-0.014641	.03	-.469	.640

Note. Bolded *p* values are significant predictors at the $p < .05$ level. "JD" = Job demands, "JR" = Job Resources, "JDR total" = Job demands minus job resources.

Table 9. Profile 3 regression results predicting group membership from all dimensions of the JDRS scale, as well as core self-evaluations, job satisfaction, age, and sex.

	Coefficients			
Predictor	β	*SE*	*t*	*p value*
JD - Workload demand	-.026	.013	-.749	.454
JR – Skill, autonomy, value	.070	.017	1.430	.153
JR - Supervisor support	-.238	.021	-4.535	**.000**
JR – Colleague support	-.006	.014	-.148	.882
JR – Inclusion in decisions	.088	.017	1.744	.082
JD - security demands	.040	.008	1.211	.226
JR – Pay satisfaction	.082	.011	1.984	**.048**

Table 9 (continued)

JDR Total	-.009	.004	-.195	.846
Core self-evaluations	.003	.001	.064	.949
Job satisfaction	.013	.002	.304	.761
Age	-.049	.001	-1.527	.127
Sex	-.026	.019	-.792	.43

Note. Bolded *p* values are significant predictors at the $p < .05$ level. "JD" = Job demands, "JR" = Job Resources, "JDR total" = Job demands minus job resources.

Table 10. Profile 4 regression results predicting group membership from all dimensions of the JDRS scale, as well as core self-evaluations, job satisfaction, age, and sex.

	Coefficients			
Predictor	β	*SE*	*t*	*p value*
JD - Workload demand	-.032	.009	-.962	.336
JR – Skill, autonomy, value	.048	.012	1.021	.307
JR - Supervisor support	.089	.014	1.755	.080
JR – Colleague support	.037	.009	.948	.344
JR – Inclusion in decisions	.140	.011	2.875	**.004**
JD - security demands	-.122	.005	-3.795	**.000**
JR – Pay satisfaction	.018	.008	.463	.643
JDR Total	.030	.003	.709	.479
Core self-evaluations	-.050	.001	-1.276	.202
Job satisfaction	.046	.001	1.138	.255
Age	.074	.001	2.384	**.017**
Sex	.020	.013	.639	.523

Note. Bolded *p* values are significant predictors at the $p < .05$ level. "JD" = Job demands, "JR" = Job Resources, "JDR total" = Job demands minus job resources.